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ADDRESS.

CONCERNING STONE IN THE KIDNEY AND ITS OPERATIVE TREATMENT, WITH REPORT OF CASES.

CHAIRMAN'S ADDRESS.

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The first, the easy, the pleasant part of my task, is to express my appreciation of the honor of being permitted to preside over your deliberations. The distinction is not lessened by the surgical achievements, past and present, of the city in which we are convened. It was in Baltimore that the common iliac artery was first tied by William Gibson before he was called to shed luster on the surgery of Philadelphia. It was here that Jameson first in the history of surgery made a nearly complete excision of the upper jaw. It was here that the son, worthy of a worthy father, Nathan Rhyno Smith, for nearly half a century fostered surgical growth. His surgical anatomy of the arteries did much toward elevating American surgery of the second quarter of the century to the high plane then occupied by that of France and of England. For a simple and efficient method of suspending an extremity are we likewise indebted to this Nestor among American surgeons. The mantles of such worthy peers have not been laid aside; they are worn with dignity and grace by younger scions. *Nomina sunt odiosa.* Great as were the early surgeons of Baltimore, they did not venture, like those of to-day, to remove the Gasserian ganglion, lay bladder, ureter and kidney open to inspection, and last but not least, extend the hope of all but absolute relief to the woman with cancer of the breast.

The rule of the ASSOCIATION calling for an annual address on surgery, fortunately relieves the Chairman of your Section of the burden of presenting in formal review the progress made. It gives him the option to limit his remarks to a single topic of surgical interest. Of this privilege I beg to avail myself, the subject of my choice being, "Concerning stone in the kidney and its operative treatment."

Clearness in the diagnosis and skill in the operative treatment of surgical diseases of the kidney are among the latest, though not the least, of the conquests of the closing decades of our century. Thorough chemic, microscopic and bacteriologic examination of the urine, cystoscopy, catheterization of the ureters, and probatory incisions, have done much to bring affections of these organs within the range of diagnostic certainty. The relative values of symptoms are becoming fixed, and in the operative technique many questions are definitely settled and more are fast nearing solution. Yet there are not a few problems pertaining to renal surgery which collective statistics alone can solve, since from the comparative rarity of the affection the experience of the individual must be greatly restricted. Such problems pertain to the diagnosis and treatment of primary stone in the kidney. To more clearly elucidate the questions to be submitted for consideration, I beg to present the following seven cases in which the kidney was explored for stone:

Case 1.—M. L., age, 27, seen with Drs. Phelps and Comegys. A robust young man under treatment for gonorrhea, for which the balsamic oils had been freely administered. Has had repeated sharp attacks of pain in the back and the left groin, but never required treatment for them. On April 1, 1892, he was seized with violent pain in the left side, radiating to the testicle. Micturition frequent. The urine was of high specific gravity and contained a large amount of blood. Three days after the inception of the attack there was a severe rigor, followed by febrile elevations of temperature of from 2 to 3 degrees, which continued until April 22. The symptoms were referred to the bladder. Dysuria was the marked subjective symptom. The quantity of urine was greatly reduced, until the quantity passed in twenty-four hours was between six and eight ounces. The patient had become irresponsive and somnolent. The tongue was dry. The urine secreted had to be removed by catheterization. Bimanual examination of the left lumbar region showed increased resistance. On deep inspiration a very decided enlargement of the left kidney, could be detected. The examination elicited pain in the region of the kidney, radiating toward the bladder. Diagnosis: pyelitis and oliguria, probably of calculus origin.

Operation, April 22; chloroform narcosis; incision of the costo-iliac interval parallel to the last rib and exposure of kidney. The organ was apparently twice its normal size, of a dark purplish color. Exploratory aspiration revealed pus. Incision through the posterior wall of the kidney substance into the pelvis gave vent to about two ounces of foul pus. In the lower end of the pelvis a small oxalate of lime calculus was found impacted; weight eight grains. The cavity of the kidney was thoroughly irrigated with sterilized water, drainage tube inserted and wound partly packed. With the relief of intra-renal tension afforded by the operation, both kidneys resumed their function; the urine passed by the bladder and through the wound was, as near as could be estimated, about equal in quantity. The temperature subsided to the normal within a week, and it looked, during the first week after the operation, as though the patient would make an uninterrupted recovery. Without discernible cause a rigor supervened on May 23. It was followed by a train of uremic symptoms identical with those of his first seizure. The urine ceased altogether to flow *per vias naturales*, and the quantity discharged from the fistula of the left side was reduced to from six to eight ounces in the twenty-four hours. On May 26 four ounces were passed from the wound. From that time to May 28 the condition of total anuria existed. Pain was complained of in the right lumbar region and palpation revealed a slight enlargement of the kidney.

May 29, 37 days after the first operation, nephrotomy was made on the right side. About one ounce of fetid pus was removed, but prolonged and careful exploration of the pelvis and ureter failed to reveal the presence of a calculus. The wound was treated as in the first instance by drainage. Within twenty-four hours the patient *quoad vitam* was on the road to recovery. The left kidney at once resumed its function and during the three years which have passed has per-

formed three-fourths of the work of both glands. The right kidney has never resumed its full functional activity. It is easy to estimate the excreting capacity of the two glands, since the patient has a renal fistula on each side, for the relief of which he will allow no effort to be made. During the last year not an ounce of urine has entered the bladder. Except for the inconvenience of carrying a urinal, the patient would consider himself restored to perfect health.

Case 2.—Jewish Hospital, June 28, 1892. J. I., age 28, salesman, of temperate habits, during three years had had frequent attacks of severe pain in the region of right kidney. During the last year these attacks were followed by hematuria. Milder attacks followed each other at intervals of one or two weeks. During the last seizure he was seen by my assistant, Dr. Evans, who pronounced it of unusual severity. Present condition: robust adult, below average height, but very obese. Physical examination negative. Bimanual examination of right kidney very painful. Kidney can not be distinctly palpated. Urine passed in twenty-four hours, forty-five ounces, reddish in color, specific gravity 1026. Microscopic examination showed a few white blood corpuscles, and oxalate of lime crystals. Diagnosis: nephrolithiasis dextra.

Operation June 30, 1892. Oblique incision. Panniculus adiposus very largely developed. Examination of the kidney difficult, owing to enormous development of fat capsule, much of which had to be removed with scissors and forceps. Kidney loosened and drawn into the wound. Palpation and acupuncture negative as to stone. Incision along convexity and digital exploration likewise negative. The hemorrhage during the search having been rather profuse, the kidney wound contused, and the search in the hope of reward having been rather prolonged, the renal wound was partly closed with sutures and a drainage tube carried into the pelvis. Nephrorrhaphy with catgut sutures. Owing to the excision of retro-renal fat masses, the avoidance of a cavity was not practicable. During seventy-two hours the patient suffered excruciatingly from renal pains, which subsided with the removal of the drainage tube. The wound healed by primary union, except for a renal fistula, which healed spontaneously within three months. During six months after operation, patient suffered from no attacks. An opportunity to see him since has not been had.

Case 3.—M. C., age 35, seamstress; entered Good Samaritan Hospital Nov. 9, 1892. States that for two years she has been suffering from lumbar pains, followed in the course of time by a constant soreness in the left side. The urine became cloudy, filled, according to her statement, with mucus and pus, and often presenting large quantities of blood. She states that sand was often passed, and in September last she passed a calculus the size of a pea. In urinating, pain is always present, and the stream is suddenly checked. She also states that she sometimes has pain down to the heel of the left foot, and that it is often of a shooting character. She had hemoptysis and cough three years ago and has frequently suffered from night sweats. Present condition: patient in poor condition, having lost about twenty to twenty-five pounds; appearance somewhat emaciated; urinalysis shows urine to be normal the greater portion of the time, but after sustaining severe pains in the bladder it contains either enough blood to tinge it or to appear in the form of clots on sedimentation. Cystoscopic examination made by a specialist indicated the presence of a neoplasm in the anterior wall of the bladder. Whereas this was far from distinct, the suprapubic incision for exploratory purposes was determined upon.

April 16, suprapubic incision displayed a bladder normal in every regard. No hemorrhage was visible at the examination. The ureters were carefully examined at the time, and nothing in the way of blood was found to come from them. Since the operation was negative in its results, the bladder wound was closed at once by Lembert sutures and the incision through the parietes packed. The wound in the bladder healed by primary intention, temperature and pulse always remaining normal. Patient was discharged from the hospital June 6, 1893, with the wound perfectly healed.

Patient re-entered the hospital March 8, 1894, and complains of severe pain in the region of the left kidney, shooting toward the groin and the leg; is also very tender to pressure over the left kidney; again has blood in the urine at intervals, especially after the pain is severe. March 28. Says that she passed a stone last night while urinating, but it was lost in the closet; no one saw it. The patient insists upon an exploration of the left kidney. April 10. Oblique incision in the left costo-iliac interval; exposure of the left kidney. The kidney was drawn into the wound and carefully palpated with negative results. Incision in the convex surface large enough to admit the finger, with exploration of the calices, likewise negative. The incision was prolonged therefore into both poles and the kidney subjected to ocular inspection. Nothing abnormal was found. The hemorrhage was relatively slight and ceased entirely after the insertion of four deep and five superficial catgut sutures. After the kidney was fixed in its position with silkworm gut, external wound was closed. By May 1 the patient had recovered without any trouble from the operation, and on June 5 was discharged. There was no further hematuria or pain of any consequence. Four months after the operation the patient presented herself at the office with a needle underneath the skin of Scarpa's triangle on the left side. This was removed, the patient claiming to have no knowledge as to how it came there.

Oct. 8, 1894. Patient visited hospital to-day; is in good health and has had no return of her trouble.

Case 4.—Good Samaritan Hospital, Sept. 20, 1894. Mrs. W., age 43, married. About seven years ago patient was sick with acute renal pains, followed by discharge of pus and blood with the urine. Since the first these attacks were invariably limited to the left side. The present attack, like previous ones, began suddenly with the sense of weight and fullness, and the detection of a swelling. Present condition: Fairly nourished woman. Temperature in the morning normal; in the evening 100 degrees; pulse varying between 80 and 100. On the left side, the kidney enlarged to the size of a double fist, can be clearly outlined in its lower segment. It presents itself as a rather movable tumor in the costo-iliac interval, not reaching the iliac crest. Urinalysis: urine often examined is turbid, light in color and containing a sediment rich in pus cells and crystals of oxalate of lime; a few red blood discs in every specimen. Very many examinations failed to reveal the bacillus of tuberculosis. Diagnosis: movable kidney, with recurring pyonephrosis, probably of calculus origin. Right kidney determined to be normal by cystoscopic examination.

Operation, September 28. Chloroform-morphia narcosis. Incision parallel to last rib. Exposure and fixation of kidney. Removal by incision of about a pint of fetid pus. Kidney sacculated. In lower portion an adherent calculus was found and removed with some difficulty. Irrigation and drainage. The patient's temperature varied from 101 to 102.5 degrees from the third day for a week. Profuse discharge necessitated daily dressing.

November 27. Patient discharged in good condition, with renal fistula and drainage tube.

Since the operation I have seen the patient once for renal distension, from displacement of tube. Nephrectomy will eventually become necessary.

The presence of an oxalate of lime calculus (weight 17 grains), with the history, makes it probable that nephrolithiasis was the first condition, followed by recurrent hydronephrosis and in turn by mobility of the kidney. Suppuration was probably a late factor in the case, which earlier interference would have prevented.

Case 5.—L. S., male, age 25, admitted to Avondale Hospital with diagnosis of recurrent appendicitis. States that except for hip disease, from which he suffered early in life, he was well until eight months prior to admission, when he was suddenly seized with severe colicky pain in region of appendix, associated with vomiting. Was free of pain for six weeks, when he suffered a second attack of great severity, which confined him to his bed during four weeks. He has never recovered entirely from this attack. States that he is always in pain, for which he has habituated himself to the use of morphia, of which he takes about three-quarters of a grain in the twenty-four hours. Present condition: well developed male. Ankylosis of right hip and complemental pelvic inclination. Complexion rather sallow. Pain more or less constant in the region of the appendix. Three times within the month the pain was severe enough to require the administration of morphia by injection. During these attacks the temperature rose to 100 degrees; at other times normal. Careful palpation fails to reveal tenderness over the appendix. Physical examination of the abdomen negative. Pressure over the last rib toward the kidney always elicited severe pain. Urinalysis: during six weeks, urinalysis made twice each week. Urine always contained in the neighborhood of .5 per cent. of albumin. It was generally light

straw color, slightly turbid, always acid. Microscopic examination always revealed pus cells and a few red blood corpuscles, and bladder epithelia. Crystals were never found. Repeated examination by centrifugation failed to reveal tubercle bacilli, the presence of which would not have been surprising with the previous history of long-standing tubercular disease of the hip.

November 4. Cystoscopic examination under cocain. Bladder normal; stream from right ureter was turbid; across the field slight flakes of white material passed from time to time. The left ureter discharges clear urine. Diagnosis: nephrolithiasis dextra.

Operation November 11. Oblique incision through the right costo-iliac interval. Exposure of the kidney, which seems normal in color and size. In the posterior wall, near the hilum, an induration distinctly palpable. Acupuncture proves it to be due to a stone. Radial incision in the line of the blood supply, followed by the easy removal of a stone, uric acid, weight 60 grains. The stone was in the substance of the gland, only slightly projecting into the pelvis. The wound in the kidney was closed by three catgut sutures. Palpation of the kidney for other stones negative. Fixation of the kidney by two silkworm gut sutures. Drainage with strands of silkworm gut.

November 12. Patient passed a restless night. Severe pain in the back, right groin and testicle. Urine very bloody and containing many clots. Quantity passed in twenty-four hours, thirty ounces. Temperature 100 degrees; pulse, 90.

November 13. Pain less severe. Passed forty ounces of urine; last samples slightly tinged with blood. Temperature normal; pulse normal.

From this time the patient's recovery was uninterrupted. The drainage was removed with the first dressing, on the tenth day. Union perfect. December 4. Patient discharged well. April 4. Patient presented himself to-day, perfectly restored to health. The urine normal in every respect.

Case 6.—Martin L., aged 28, single. Entered Good Samaritan Hospital Feb. 26, 1894. History for the past five years: has had severe pains in the region of the left kidney. Very frequently he has suffered from severe pains shooting down the groin and the left testicle and into the leg. These attacks are usually followed by the appearance of blood in larger and smaller quantity in the urine. These attacks last from one to three days. Present condition: well-nourished man of short stature. Pressure over the left last rib very painful. No enlargement of the kidney discernible. Urinates three to four times during the night. The urine turbid, specific gravity 1040, rich in albumin and red blood corpuscles. Contains also oxalate of lime crystals.

March 3. The patient just passed a very bad night, has suffered intensely from on attack of renal colic. Urine passed frequently and containing large quantities of blood. Morphia administered in grs. ¼ doses at 3 in the morning and again at 9. Diagnosis: renal calculus.

March 10, operation. Oblique incision over the left kidney from the middle of the last rib toward crest of ilium. Kidney exposed and brought into the wound. In the pelvis of the kidney a number of loose calculi were felt. Incision one inch long through convex border, circulation being controlled by the finger of an assistant. Hemorrhage slight, but drainage of a considerable quantity of urine. Three stones were easily removed from the pelvis. Two smaller ones adherent to the calices removed by blunt curette. Suture of the kidney wound by three deep and two superficial catgut sutures and sewing of the kidney to the deep fascia. For purpose of drainage, there having been considerable oozing from the peri-renal tissue, the wound was very firmly packed with gauze. March 11. Patient passed a very bad night, vomited considerably and complained of some abdominal pain. Passed from the bladder ten ounces of bloody urine. Ordered a teaspoonful of Epsom salts every two hours. Dressings changed and gauze removed. No drainage of urine from the wound. Wound looks healthy. March 12. Evidences of intestinal obstruction, vomiting recurring at intervals of half an hour has assumed the form of regurgitation. Bowels have not moved. Abdominal distension very marked. Temperature 100; pulse between 120 and 130; quantity of urine in twenty-four hours, twenty-seven ounces. March 13. Patient passed a very bad night. Regurgitation more marked. Temperature 96; pulse 160; 11:30 P.M., patient died.

March 14. Autopsy. Abdomen very much distended. Upon opening the abdomen the intestines, from the descending colon upward, including all of the small intestine to the duodenum, very much distended; peritoneal vessels, mesenteric and intestinal, are very much injected. There is no pus present, nor are there any flocculi of lymph to be found. Very thorough search of the peritoneum over the kidney fails to reveal any wound of this tunic. Left kidney presents a wound along its convex border quite firmly agglutinated. About the incision some infiltration of blood in the cortex of the kidney. Right kidney normal.

Case 7.—D. K. G., male, age 47; observed with Dr. Forchheimer. Family history good; has never been seriously ill, except three years before he came under observation, when he was confined to his bed with severe pain in the left lumbar and inguinal regions, which was ascribed to ileo-colitis. Within the last year he has suffered a number of times from chills followed by febrile elevations. These seizures would keep him indoors for twenty-four or forty-eight hours only. During these attacks he would frequently vomit. He has not lost in weight. His greatest complaint has been pain in the back, which would awaken him in the night. The pain has never been severe enough to necessitate the use of morphia. It has been limited to the left side, and never assumed the form of renal colic. Has twice been examined for bladder trouble and each examination was followed within an hour by a rise of temperature to 104 degrees. Within twenty-four hours the temperature subsided to the normal. This patient was under my observation during six months. He was enabled to follow his vocation, and except for pains at night, and what he believed to be malarial seizures, suffered comparatively little. On the part of the urinary tract there were no subjective symptoms. Micturition was neither abnormally frequent nor painful at any time. Physical examination negative, except for a very marked tenderness over the left kidney, which could always be evoked by deep pressure against the last rib. Bimanual examination failed to reveal any enlargement of the kidney, nor were referred pains ever elicited. Urinalysis. During six months his urine was examined at least once a week. It was always slightly turbid when passed, a little paler than normal, acid in reaction and of normal specific gravity. Every specimen contained a trace of albumin, a number of pus cells and a few red blood discs. At no time during the prolonged period of observation did the specimens obtained by centrifugation contain either crystals or tubercle bacilli. During the last month prior to operation, the pyuria increased notably.

November 25. Cystoscopic examination under cocain. Bladder normal. Ureters brought into view, and streams of urine found alike on the two sides. About the left ureteral orifice, there was an area of redness, extending apparently a half inch toward the urethra. Hemorrhage was not observed. The examination, though made with every precaution to the contrary, was followed within two hours by a chill and a rise of temperature to 104 degrees. In three days the patient was again about his work. Diagnosis: nephrolithiasis sinistra.

Operation, at Christ Hospital, Jan. 22, 1895. Morphia and chloroform anesthesia. Oblique incision through costo-iliac interval. Exposure of kidney through *capsula adiposa* of moderate thickness. Kidney, apparently of abnormal length, drawn into the wound and carefully palpated with negative results. Acupuncture resorted to without locating a stone. With digital compression of the renal pedicle, the autopsy cut was made and the interior of the gland subjected to palpation and inspection. The incision was attended by very little hemorrhage; nor was any pus evacuated. The kidney structure was normal. In the lowermost portion of the pelvis an elongated stone was found, opposite the beginning of the ureter. An effort to remove it through the incision in the kidney failed. Therefore the pelvis was opened by a longitudinal incision. The stone was easily removed. Wound in pelvis closed by two catgut Lembert sutures. For the closure of the kidney wound, three deep and four superficial sutures were used. After fixation of the kidney with silkworm gut sutures, the wound was closed, a strand of gut being used for drainage. An uninterrupted recovery followed the operation. During seventy-two hours the urine contained considerable blood, and the colicky pains were severe enough to necessitate the use of morphia. Hemorrhage from the kidney ceased on the third day. The

highest temperature reached was 100 degrees. The quantity of urine was twelve and one-half ounces the first twenty-four hours; twenty-one ounces during the second; thirty-seven ounces during the third, after which the quantity was normal. The patient has had no attack of pain since the operation. The urine still contains a few pus corpuscles, but red blood discs are not to be found. First dressing and drainage was removed on the tenth day; sutures at the end of two weeks. Primary union along the entire line. The patient left the hospital after five weeks, well, except for the presence of pus cells in the urine. In four examinations made since his departure from the hospital, blood discs were not found. In two examinations of urine recently made, oxalate of lime crystals were found.

Stone in the kidney is far from being a rare affection, if the records of autopsies are to be judged from. In the majority of cases thus found, they were unattended by tangible symptoms. On the other hand, no other affection of the kidney is so often erroneously supposed to be present as stone. Of the seven nephrotomies here recorded and made for stone, the search proved fruitless in two. In 1886 Gross [1] was already enabled to collect twenty-nine cases of unsuccessful operations for stone, all of which recovered. A few years later McCosh [2] found five additional cases of which two were fatal. These were cases of Chavasse, [3] and in both calculi were found at the autopsy. Similar unfruitful explorations have since been made, twice by Keyes [4] and Parkes, [5] once by Guyon, [6] Bruce Clark, [7] Tiffany [8] and Israel [9]. While it is probable that in some of these cases a small concretion was overlooked, the thorough exploration after incision made by such competent operators must lead us to believe that there is a condition of the kidneys, other than lithiasis, which is expressed by the symptomatic tripod of renal calculus before destructive changes have been produced, namely, lumbar pains, renal colic and hematuria. The term "nephralgie hematurique," proposed by Sabatier[10], describes the cardinal symptoms but does not explain the condition which varies with the varying causes of hyperacidity of the urine, syphilitic cicatrices, mobility of the kidney and consequent intermittent hydronephrosis or hemophilia with renal expression of its presence. In a nephrectomy done for hematuria by Senator, [11] the kidney was found absolutely normal. For diagnostic purposes, catheterization of the left ureter was made by Nitze through a suprapubic incision, and the source of the hematuria, if not its cause, satisfactorily determined. In one of my own cases, although the kidney was not removed, the hematuria was doubtless of like hemaphilic origin, for the kidney upon section was found absolutely normal. (Case 3.)

An array of forty-four recorded cases of failure to find a stone may be of importance in damage suits arising from such failure. They demonstrate that the diagnosis can be only approximately made. The record is equally significant in showing the safety of such explorations since only two deaths are recorded, and in both cases stones were found at the autopsy. It is equally noteworthy that in many of the cases thus operated upon, permanent relief was afforded by the exploratory incision, either in consequence of section of the lumbar nerves or of relief of intra-capsular tension, the severance of adhesions or the fixation of a previously movable kidney. In not a few, however, has there been recurrence of symptoms in from a few weeks to a year.

In the diagnosis of kidney stone, writers have for many years pointed to the presence of abnormal constituents in the urine. First, crystals indicative of the character of the stone; and second, blood in quantities appreciable to the unaided eye. The hemorrhage, it is said, is rarely as profuse as in malignant disease, but yet is present in considerable quantity. In both regards, observations often and carefully made will be negative. In two of the cases very accurate examinations for a period of from one to six months were made and crystals were not found. Except when a stone is in the process of growth, the presence of crystals can hardly be expected. Furthermore, to be of clinical significance, the crystals must be proved to be passed with the urine, and not to have been formed later. In only one of the cases of successful nephrotomy for stone recorded above, was the hematuria apparent. Far more important, however, it appears to me, is the presence of red blood discs at every microscopic examination made. In three of the cases the examination extended over a period of from one to six months, without out failure to find a few discs in every specimen examined. In all of these cases the microscopic hematuria was associated with acid pyuria. The aseptic character of the latter in two of the cases was repeatedly demonstrated by centrifuging. Mechanical irritation, pressure, necrosis of the renal epithelium and minimal erosions of capillaries produced by a renal calculus accounted for the slight hematuria and the pyuria, aseptic in its character.

This does not accord altogether with the views, particularly of the French school, as expressed by Tuffier regarding the ability of the kidneys to entertain without any reaction, aseptic bodies of even large size, and that when septic infection does ensue, it is the result of upward extension of like processes from bladder and urethra, either from a gonorrhea, or unclean catheterization. Large and small stones by their presence produce pressure, atrophy and cirrhosis. In the specimens here presented, of two kidneys in which large primary calculi are found, the area of atrophy will be seen just a little larger than the measurements of the concrements, which by pressure on the vessels had induced an aseptic infarct and secondary atrophy of the contiguous kidney tissue. The kidneys, as a whole, present the picture of interstitial nephritis. Although growing into the ureters and filling the pelvis, the stones have produced no destruction of either. Yet the inspection of these kidneys assures us that had pleuro-pneumonia not claimed the individual, death must have resulted soon from renal changes which, slow, mechanical and aseptic, were none the less destructive to the secreting elements. Regarding the history of this case, nothing is known, although it is almost inconceivable that an examination of the urine would have failed to detect evidence of renal disease.

Regarding the channels of septic invasion in renal lithiasis, it appears to be far from certain that the usual route is from below upward, as it doubtless is in the typical surgical kidney developing in the course of primary lesions of the lower urinary tract. In two of the recorded cases there never had been a gonorrhea. In three of them, instrumentation of the bladder had not been practiced until after the discovery of the pyuria. Posner and Lewin [12] have recently made very interesting experimental observations which establish the auto-infective nature of many suppurative processes of the urinary passages, and which throw much light upon the cause of sup-

puration in cases of stone in the kidney where instrumentation had not been practiced. The source of infection is the intestinal canal and the channel the general circulation. The eliminative function of the kidney has been shown for other infectious diseases. In the case of suppurative processes, thus produced experimentally by ligating the ureters and obstructing the intestine, the bacillus found in the kidney was almost always the gas-forming organism belonging to the bacterium coli group. Pyuria from stone may, therefore, be aseptic; or, if septic, be the result of infection from the lower urinary tract, or caused by the eliminative function of the kidney.

The value of cystoscopic examination, as an auxiliary to the diagnosis of renal calculus can not be questioned. The presence of two discharging ureteral mouths assures us better than any other method can, of the presence of two active kidneys. It can not exclude the possible existence of a horse-shoe or placental kidney with double ureters. The certainty of the non-existence of vesical disease, as established by the cystoscope of Nitze or of Kelly, often makes it certain that the symptoms in a given case are of renal origin. In two of the three cases in which it was used, the information was of absolute value in excluding the bladder as the source of the disease and fixing the site of the latter. In one of the cases a turbid stream with a few flocculi was ejected from the right ureteral cone, while the urine from the left side was very clear. In a second case the left ureteral mouth presented an irritated appearance entirely at variance with the picture of the right side. In the third case, one of profuse hematuria, cystoscopic examinations were entirely negative. With a wider knowledge of direct catheterization of the ureters, as practiced by Pawlik, and of the better method of direct illumination of the bladder, as practiced by Kelly, the elucidation of obscure renal disease will doubtless be made comparatively easy. In the male it may be justifiable to resort to suprapubic incision and direct catheterization of the ureters for diagnostic purpose. Quite recently, Nitze has added the ureteral catheter to his cystoscope. It is not probable that many will become experts in its use. Unfortunately, the cystoscope is of no value in cases where it would be most needed; those in which there is an *indicato vitalis* for operative interference, particularly on account of hematuria and anuria.

Anuria is by far the most interesting, as it is also the most fatal, complication of kidney stone. Of fifty-six cases collected by Legueu,[13] treated conservatively, sixteen recovered in from three to twenty days; forty or 71.5 per cent., died in from four to twenty-five days. Autopsies were made in thirty cases. In twenty-three, the ureter was found blocked by a stone, while in seven a gross mechanical obstruction was not present. In three cases there was only one kidney. In six, both ureters were blocked by a calculus. In fourteen additional cases, both kidneys contained stones. In six, there were other evidences of disease, chiefly suppuration, and in one case the kidney was normal. In sixteen cases of anuria, nephrotomy was followed by recovery in ten, the mortality being 37 per cent., as against 71.5 per cent., in cases left to nature. Such statistics justify the division of nephro-lithotomies into those of choice and those of necessity. The conditions may well be likened to those of hernia. In the unobstructed, we may choose the time for operative interference; in the strangulated, delay means death. Anuria in calculus disease may be the result of a simultaneous obstruction of both ureters, a condition which is quite unusual. It generally depends upon obstruction of the ureter of one kidney, and reflex arrestation of function of its fellow, which in the majority of cases is likewise found to be diseased. That primary anuria or oliguria may be the result of inhibition of a normal kidney through reflex channels from obstruction in its diseased fellow, or after nephrectomy, has been positively settled by experimental as well as by clinical observations. Among the most striking of the latter was one made by Israel [14] in a case of hydronephrosis of intermittent type. With each recurrence of increased intra-renal tension in the diseased kidney,the secretion of normal urine was reduced to a minimum. Tapping of the hydronephrotic side was immediately followed by the flow of the normal amount of urine from the healthy kidney. Pressure upon the kidney tissue or irritation by packing or ligation of the pedicle after nephrectomy, may bring about the same reflex diminution of function of the remaining gland.

Death follows nephrectomy from uremia in nearly 50 per cent. of cases, (Madelung [15] eight out of seventeen). In most of these it has been presumed that there existed but one kidney. For such cases in the future it will be obligatory to explore the side not previously operated upon, and if a kidney be found, to make an exploratory incision. It is more than probable that the sudden increase in function of the remaining gland is associated with a degree of hyperemia incompatible with excretion from the glomeruli, for which the local depletion of nephrotomy could only be of benefit.

Since Bardenheuer's [16] case of nephrotomy for anuria after operation on one kidney was published in 1882, a number of most brilliant successes have been recorded by Lange,[17] Clement Lucas,[18] Meyer,[19] Kirkham,[20] Godley,[21] Israel[22] and Cabot[23]. In most cases, as in my own, the operator was relieved of the difficulty of determining the side for operation by the previous clinical history, the limitation of pain to one side, by the presence of tenderness or tumor, or by the previous removal of one kidney. Except for the certainty give by the condition last named, there must always be some doubt as to the side to be operated upon. In a case of anuria, Israel operated on a hydronephrotic left kidney. The patient was not relieved. Twenty-four hours later the right kidney was explored and a stone located in the ureter too low for removal at the time. The patient did not rally, the anuria having continued nine days. Tuffier has properly pointed out that operation should not be deferred on account of doubt as to the side of obstruction, since the chances are always 50 per cent. that the diseased kidney will be found, and it might be added, if the chance fails an immediate exploration of the opposite side should be made. I have been enabled to find only one case of simultaneous bilateral nephrotomy for calculus anuria. The patient died eleven days after the operation.[24]

In the surgical treatment of renal calculus, choice must be made between simple incision and extirpation or partial resection of the kidney. The localized conditions demanding the latter must of necessity be so rare that for present considerations they may be disregarded. Nor would any one resort to the more drastic operation with a comparatively normal

condition of the kidney and a small calculus. It is in the presence of multiple or of large branched calculi and of a kidney more or less converted into an abscess cavity that the question becomes embarrassing. Neither the size, conformation nor multiplicity of the calculus ought to weigh in favor of nephrectomy, since with the longitudinal incision along the renal convexity, ample room for manipulation can be obtained. Nor does the dread of a renal fistula remaining after nephrotomy for calculous pyonephrosis render nephrectomy justifiable, except when cystoscopic examination or the voidance of clean urine renders unimpeachable evidence of the presence of a normal kidney; for in seventy-six fatal cases of renal calculus, Legueu found the disease bilateral in thirty-eight and in only four instances was the remaining kidney normal. Edel,[25] Clement Lucas,[26] Shepherd [27] reported cases where nephrectomy was followed after four and five respectively, by fatal calculous pyelitis of the remaining kidney. These considerations are weighty, irrespective of the inherent dangers of the two procedures, nephrotomy and nephrectomy, the mortality of which is decidedly in favor of nephrotomy (nephrotomy 31 per cent., nephrectomy 41 per cent).

With increasing confidence in the relative safety of exploratory nephrotomy, cases of renal calculus will doubtless be earlier subjected to operation and before those destructive changes have ensued which, at the time of operation, force upon surgeons the choice between incision and excision of the kidney. With proper care regarding hemorrhage and sepsis, a nephrolithotomy on an otherwise healthy kidney ought to be attended by a mortality of not more than 5 per cent. The unequalled tabulation of Newman, in 1888, of forty-two cases without a death, could not be maintained. Tait lost one case out of fourteen. Within the last three years, deaths have occurred in the hands of such expert operators as Butler-Smythe, Jacobson, Knowsley Thornton, Godlee and Israel. The immediate mortality of nephrotomy for calculus pyelitis is 33 per cent. A stronger plea than these statistics could not be made for an early operation in real or supposed cases of renal calculus.

In the technique of the nephrotomies above recorded, I have had an opportunity of comparing the relative values of the oblique and the transverse incisions. The advantages of the former have been so decided that I have used it to the exclusion of the other in all of my recent operations on the kidney from the loin. Through an ample incision from the middle of the last rib toward the iliac crest, the entire kidney can be drawn into the wound, the pelvis, both surfaces and poles, explored by the finger, and the circulation through it absolutely controlled. By continuing the incision downward and forward, all of the suprapelvic portion of the ureter can be brought into view and, if need be, subjected to operative treatment.

The renal calculi which I have presented are all small, the heaviest weighing sixty grains. In this regard the collection may be interesting, since in all of the cases of which they are the trophies, except one, the exploratory needle was used and without any results. In none of my cases was the detection of the stone accomplished by using the needle. A stone weighing 556 grains, as removed by Tiffany,[28] or one weighing nearly five ounces, as removed by Shepherd,[29] and another by Gay,[30] can easily be felt through a puncture with a needle. Here acupuncture is superfluous, since such stones can be felt through the hardened kidney substance by the examining finger. For the detection of small stones a success from acupuncture would be a matter of chance, and therefore, in my judgment, should be discontinued as wasteful of time and fraught with the danger of wounding a larger branch of the renal vessels. Palpation of the kidney drawn well into the wound between the thumb and finger on opposite surfaces, will reduce the danger of overlooking a calculus to a minimum. In this manner all of the kidney, except possibly the superior pole on the left side, can be thoroughly felt. If the calculus even then escapes detection it must be small indeed, deeply imbedded, and discoverable only by incision into the kidney substance.

How and where shall this incision be made? In answering this question two considerations must guide us: hemorrhage and the final result as to a cure without a renal fistula. Hyrtl[31], as long ago as 1869, demonstrated by corrosive preparations that the kidney is naturally divisible into anterior and posterior segments, the blood supply of each being independent of that of the other, after the vessels supplying them have been given off from the main trunk of the renal artery. Along the convexity of the gland, therefore, the longitudinal section made as in an autopsy would be least likely to wound a larger vessel. In four operations in which I have resorted to this sectional incision the hemorrhage, while free, was parenchymatous in all. To reduce even this to a minimum the incision should not be made longer than is needful for the introduction of the exploring finger, until the kidney has been brought far enough into the wound to make feasible the compression of its pedicle by padded clamp, or preferably by the fingers of an assistant. This makes the hemorrhage *nil*, while the search for the stone progresses. Such compression has been experimentally maintained for half an hour (Tuffier) in animals without other effect than a transitory albuminuria. In an operation for stone, compression would rarely be needed during more than five minutes. The length of the incision must vary with the difficulties encountered in searching for and removing the stone. With a finger introduced into a kidney through a small incision in the center of its convexity, or two incisions nearer the poles, the separate calices can be as methodically explored as are the fingers of a glove. Only after failure of this method to find a stone does the complete division of the kidney from end to end, for ocular inspection, as in a post-mortem examination seem justifiable. Incisions into the renal pelvis for exploration alone are to be avoided because of the obviously greater danger of hemorrhage and the dread of lacerating the pelvic wall beyond repair.

Renal fistulæ are seen oftener after incisions into the pelvis than after nephrotomy proper, the ratio being as 20 to 3. Therefore, stones found in the pelvis of the kidney should, wherever possible, be removed through an incision in the cortex. In one of my cases a stone was found embedded near the posterior surface. In such a case a radial incision on to the stone, passing between the blood vessels, is ample for its removal and not attended by severe hemorrhage.

For operative wounds of the kidney, primary union should be aimed for, as scrupulously as in wounds elsewhere. Drainage of the kidney is therefore un-

called for except for pyonephrosis, where the ureter is manifestly incompetent. In one of my cases the presence of a drainage tube gave rise during seventy-two hours to very severe pain, and was the direct cause of a fistula which continued to discharge during three months before it finally closed. In nephro-lithotomy on an otherwise normal kidney, the ideal operation is terminated by closely suturing the wound in the kidney with alternate deep and superficial catgut sutures, traction on which should only be sufficient to keep the edges in apposition. Experimentally and clinically, such sutures have been shown to be practically innocuous to the kidney at large, and that the resulting scar involves only the immediate vicinity of the line of incision and of the sutures, provided larger vessels are not included. Experiments by Paoli,[32] Tuffier[33] and Barth[35] have shown that, particularly in the incision along the convexity, secondary degenerative changes are reduced to a minimum. Griefenhagen[35] had an opportunity to examine two kidneys treated by sutures after operation. A linear and depressed cicatrix narrowing toward the pelvis and firmly adherent to the capsule was present in each kidney as the only vestige of a previous incision. One patient died of apoplexy six months after the operation. In the other, the kidney had become movable and at times incarcerated in a ventral hernia making nephrectomy necessary. Suture of the kidney first practiced by LeDentu,[36] in 1889, has been performed successfully by Morris, Israel, Fenger, Bernays, Tuffier, Garard, Marchant and Rose.

Primary union should likewise be sought for when the pelvis or ureter has been incised; catgut Lembert suturing being used. The probability of success is less than in nephrotomy proper. In one of my cases thus treated the result was perfect. Meyer and Sanger have recently reported similar successes. A slight objection to primary suture is the severe pain of a colicky nature entailed by the passage of small blood clots through the ureters and lasting from twenty-four to forty-eight hours.

The only fatal result which I have had to record from my nephrotomies for stone was directly attributable to intestinal obstruction from excessive packing of the wound with gauze. This obstruction was the result of paralysis from pressure on the intestinal nerves in their course in the meso-colon and behind the posterior parietal layer of the peritoneum. This is the second case of this nature to be recorded; the other occurred in the hands of Israel. There probably have been other deaths erroneously ascribed to peritonitis after operation on the kidney and in which wounding and infection of the peritoneum have been supposed to be the causes of death. In two of the cases operated on since this unfortunate result, I have contented myself with such drainage as could be obtained by a strand of silkworm gut removed with the first dressing.

The concluding act of every operation upon the kidney must look toward fixation of the gland in its normal position. Where the fat capsule has not been interfered with much and the kidney has been little disturbed in its relations in the process of searching for and removing the stone, nature can be relied upon to secure its proper fixation. In every case, however, in which the gland has been removed from its bed and drawn into the wound, either for purposes of exploration or operation, a *sine qua non* of an undisturbed and lasting recovery is the fixation of the kidney in its position by a number of catgut or, preferably, of silkworm sutures. A number of recent writers have suggested that the sutures used for closing the renal incision can likewise be employed for the fixation of the gland. My own preference has been for the silkworm gut. By two sutures through the kidney, the capsule proper, and the fat capsule on the one hand, and the lumbar fascia and the periosteum of the last rib on the other, the kidney can be firmly and satisfactorily anchored until such time as post-operative adhesions result. One of the safeguards against mobility of a kidney is, in my judgment, prolonged rest in bed of at least five to six weeks before the patient resumes the erect posture. In the triumph of finding a stone, the precautions against a movable kidney might readily be overlooked. The danger of allowing the gland to take care of itself has been shown in a number of cases, and notably in the one of Griefenhagen already referred to, where secondary nephrectomy became necessary.

In conclusion, the following theses are presented for your consideration:

1. An absolute diagnosis of stone can not be made.
2. Nephro-lithotomies may be divided into those of necessity and those of choice. In anuria and profuse hematuria delay is fatal.
3. Pyuria and microscopic hematuria as indications of beginning destructive changes, are positive indications for operative exploration.
4. The oblique incision is to be preferred for the ease with which it permits the exploration of the entire kidney.
5. Acupuncture is not to be relied upon.
6. Incisions should be made along the convex border and only when the circulation is controlled by digital compression.
7. Incisions into the pelvis for exploration and for removing a stone are to be avoided.
8. Primary nephrectomy for stone should be reserved for extreme cases.
9. Primary union by suture, where feasible, makes nephro-lithotomy an ideal operation.
10. Tight packing of the kidney wound and perirenal space endangers the nerve supply of the colon.
11. Nephrorrhaphy should form the closing act of every operation which has seriously disturbed the relations of the kidney.

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ORIGINAL ARTICLES.

CONSERVATIVE SURGERY ON THE BATTLE-FIELD AND FIRST AID TO THE WOUNDED.

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CHICAGO.

Conservatism will characterize the military surgery of the future. The two great sources of danger that face the wounded soldier upon the battle-field—hemorrhage and infection—will be greatly diminished by additional and improved hemostatic measures, and the more general and effective application of the principles of aseptic and antiseptic surgery.

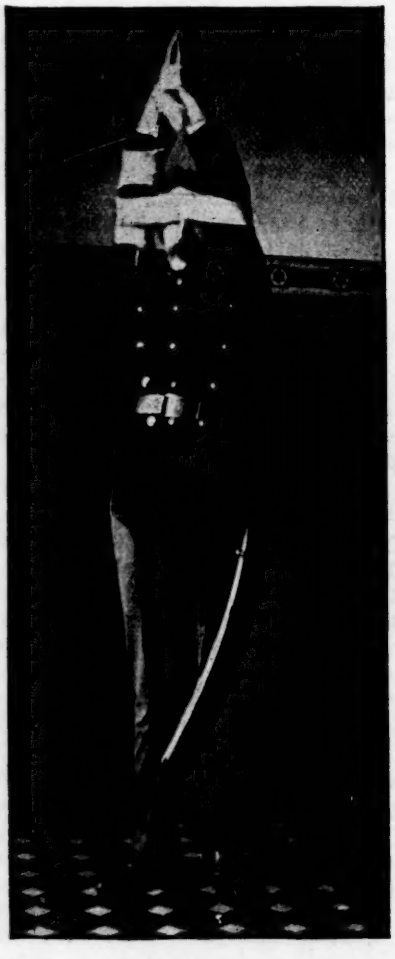

FIG. 1.—Elevation of the upper extremity in the treatment of hemorrhage.

Mutilating primary operations will be limited to injuries with extensive destruction of the soft parts and complications involving large vessels and nerves which in themselves are sufficient to arrest the nutrition of the injured limb. Gunshot injuries of bones and joints will no longer determine the propriety of primary resection and amputation, and the danger of penetrating wounds of any of the large cavities of the body will be greatly diminished by the prompt employment of measures calculated to prevent septic infection, and other immediate and remote complications. I take it for granted, that I am expected on this occasion to discuss briefly the salient topics which will engage the attention of the military surgeons of future wars, and which will enable them to reduce the death rate, diminish suffering, save limbs, and prevent painful remote complications in case of bullet and other wounds which heretofore demanded primary mutilating operations, or, if treated upon conservative plans, subjected the soldier to imminent danger to life from septic complications.

Conservative surgery on the battle-field consists in rendering prompt and efficient aid to the wounded. To accomplish this successfully is the desire and aim of the military surgeons of all civilized nations. A well-trained hospital corps is now looked upon as an essential constituent of every modern military body. In our own country the Army and Navy, as well as the National Guards of the different States, are making ample preparations for effective first aid to the wounded, in the event of war, by the careful training of soldiers selected for Hospital Corps service. The practice of conservative surgery upon the battle-field will, of necessity, be intrusted largely to the educated, well-trained, non-combatant soldier. It is the character and efficiency of his work that will determine the fate of the wounded. I shall limit my remarks to the discussion on the work to be done by the surgeon and his helpmates, the members of the Hospital Corps, in caring for the wounded upon the battle-field, which will embrace: 1, the treatment of hemorrhage; 2, to counteract shock; 3, primary dressing; 4, immobilization; 5, transportation.

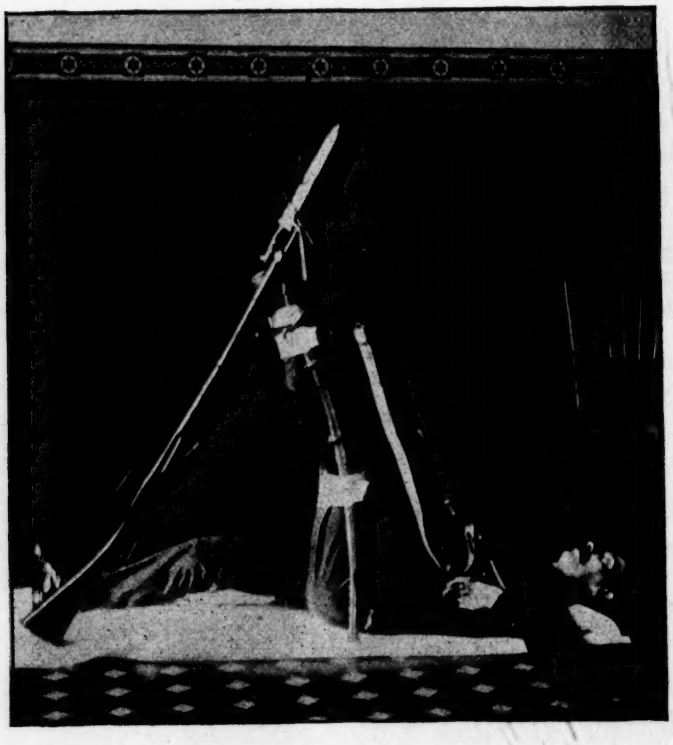

FIG. 2.—Gun-stack for elevation of the lower extremity.

Temporary Hemostasis.—A large percentage of deaths upon the battle-field has been caused by the immediate result of hemorrhage. It is to be expected that the small calibre bullet, owing to its greater velocity and penetrating power, will cause death more frequently from primary acute hemor-

rhage than the round or large conical bullet of the past, because the wounds inflicted by it resemble more nearly incised than contused wounds as was formerly the case. There can be but little doubt that the old weapon produced wounds which were more liable to be followed by secondary hemorrhage, induced by the sloughing of the large area of contused tissue surrounding the tubular wound made by the bullet. The absence of this extensive area of contusion and laceration in wounds of large blood vessels made by the new bullet will increase the danger from primary hemorrhage, and will, consequently, demand more frequently and urgently in their treatment the employment of prompt and efficient hemostatic measures. The treatment of hemorrhage upon the battle-field will be governed by the size and character of the vessel wounded and the part or organ injured. A distinction between arterial and venous hemorrhage is impracticable as far as the immediate treatment by non-professional assistants is concerned. Ligation of a blood vessel upon the battle-field, either at the point of injury or in its continuity, will be done only in exceptional cases. In

FIG. 3.—Digital compression of brachial artery.

the majority of instances this part of the treatment will be consigned to the surgeons in charge of the first dressing station or the field hospital. In rendering the first aid to the wounded, hemorrhage should be diminished or arrested by such means and measures as are always at hand, or that can be readily extemporized and can be safely and efficiently applied by members of the Hospital Corps.

Elevation of Limb.—The force of gravitation answers an exceedingly useful purpose in arresting hemorrhage from the smaller vessels of the extremities. By placing the injured limb in a vertical position, intravascular pressure is so much diminished that spontaneous arrest of hemorrhage is often effected by this simple procedure, even when a vessel the size of the palmar arches is injured, but its greatest value and widest range of application will be in the treatment of venous and parenchymatous hemorrhage. The elevated position should be maintained for some time after the hemorrhage has ceased, or until more efficient measures can be employed. The manner of effecting and maintaining elevation as a hemostatic agent is shown in Figs. 1 and 2.

Digital Compression.—In the treatment of hemorrhage from large vessels accessible to digital compression, this method offers a reliable means of controlling hemorrhage. The members of the Hospital Corps are familiarized with the exact location of the principal arteries of the extremities and the method of arresting hemorrhage by digital compression.

The compression must be continued uninterruptedly until the bleeding vessel can be tied, or pressure can be replaced by elastic constriction or the antiseptic tampon.

Flexion.—Forced flexion as an hemostatic agent was introduced by Adelmann. Genuflexion is a prompt and efficient method of arresting hemorrhage from the popliteal artery and its branches. Brachial hyperflexion answers the same purpose in the treatment of hemorrhage from the brachial artery from a point opposite the elbow joint or any of its branches below this point.

In making genuflexion, the belt, suspender, gunstrap, or triangular bandage should be passed

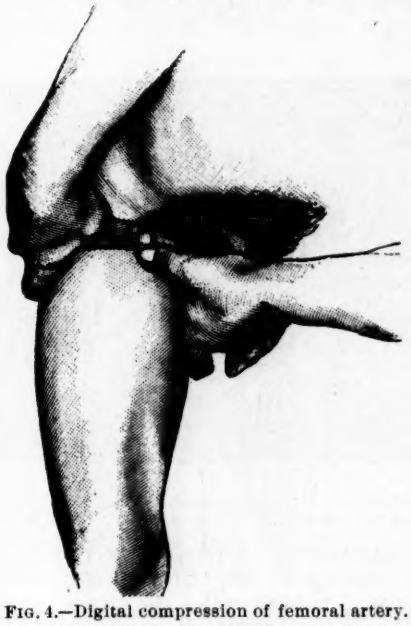

FIG. 4.—Digital compression of femoral artery.

through a slit in the shoe or boot above the heel, after which the ends are firmly tied over the base of the thigh where it is fastened to the pants or drawers with a safety pin. Forced flexion of the forearm can be made with an ordinary handkerchief.

Elastic Constriction.—Elastic constriction, properly applied, is a safe and absolutely reliable hemostatic agent in preventing and controlling hemorrhage from any of the vessels of the extremities. Introduced and popularized by the greatest military surgeon of the present time, von Esmarch, it is applied wherever surgery is practiced, but its employment is of special value upon the battle-field. The elastic constrictor has displaced almost entirely the ordinary tourniquet. Preliminary compression of the limb by an elastic bandage is unnecessary, as simple elevation continued for a few moments will render the limb sufficiently bloodless for all practical purposes. The harmful effects of elastic constriction improperly applied are temporary, and even permanent paralysis of one or more of the principal nerves injured by the

linear compression. To prevent such a complication it is necessary to compress the limb at a point where the main nerves are adequately protected by muscles and to bring to bear no more pressure than is necessary to realize the object for which the constriction is made—to interrupt completely both the venous and arterial circulation. The arm should be constricted at a point corresponding with the middle of the deltoid muscle or over the top of the shoulder and the thigh near its base.

To avoid harmful linear constriction it is advisable to use an elastic band at least an inch in width or a suspender, and if the constrictor encircles the limb more than once, to bring each turn separately down upon the surface of the limb and not overlap each other. An assistant should hold the limb firmly in a vertical position when the constrictor is applied over the side of the limb where the large blood vessels are located, and the constriction quickly and firmly made so as to interrupt at once, completely, both the arterial and venous circulation. How long is it safe to exclude from a limb the circulation by elastic constriction? This is an important question which presents itself with special force in the practice of military surgery. I made, a few years ago, an interesting series of experiments on dogs for the purpose of formulating an authoritative answer to this question. Elastic constriction was applied by using rubber tubes the size of an ordinary lead pencil, and the constriction was continued from one to twenty-six hours. Temporary paralysis was observed in a number of cases. Gangrene of the limb below the point of constriction resulted only in one case, and in this instance the constriction was continued for twenty-four hours, while the dog in which the constriction was continued for twenty-six hours recovered in a short time perfect use of the limb. The blood contained in the arteries and veins below the point of constriction remained fluid and retained its intrinsic functional properties for this length of time after complete exclusion from the general circulation. Elastic constriction is not attended by any special danger from this source. Every surgeon has had cases in which elastic constriction was continued for several hours, in the performance of difficult and tedious operations, without witnessing any untoward, immediate or remote results from the prolonged interruption of the circulation. I have learned of a number of cases of railway injuries in which elastic constriction was continued from seven to twelve hours without any obvious harmful results. From the results of my own experiments and the clinical data on elastic constriction as a hemostatic resource, I am satisfied that it is safe to exclude the circulation from a limb for four to six hours without incurring any special risks of gangrene or permanent damage to large nerve trunks. The exact limit of prolonged constriction in man has not been determined, and I should consider it unwise to continue it beyond the time specified. In the majority of cases during this time the wounded will be brought to the attention of surgeons when the injured vessel is exposed and tied, or elastic constriction is replaced by direct compression.

FIG. 5.—Genuflexion in the treatment of hemorrhage from the popliteal artery and its branches.

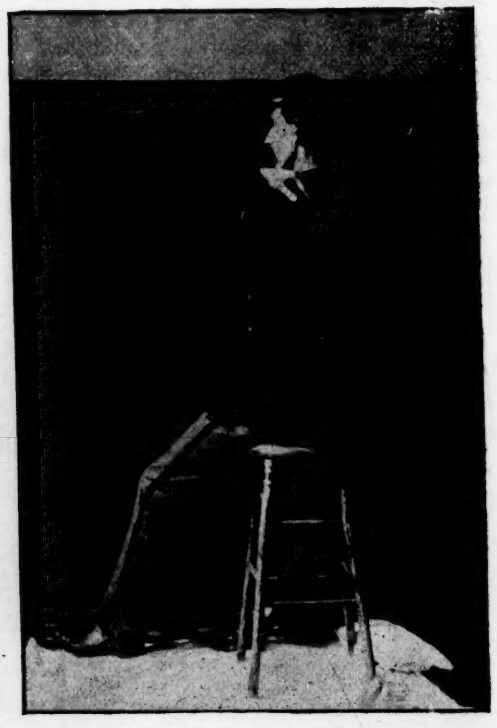

FIG. 6.—Forced flexion of forearm in arresting hemorrhage from the brachial artery opposite the elbow joint or any of its branches below this point.

Antiseptic Tampon.—The antiseptic tampon is a convenient and very useful hemostatic agent in the treatment of accidental hemorrhage. The antiseptic package with which every soldier of civilized warfare will be supplied can be used advantageously for this purpose. It will prove of special value in the arrest of hemorrhage from the vessels of the scalp, face and intercostal arteries, and in the treatment of open lacerated and sabre wounds. The surface to be compressed should be dusted with the antiseptic powder contained in the package, and with the hygroscopic antiseptic material composing the balance of the package a graduated compress is made, the apex of which is placed in contact with the bleeding vessel, and the necessary degree of pressure secured by a circular bandage with or without the use of an extemporized splint according to the location of the vessel, or the relations of the injured vessel to the underlying bone.

Vessel injuries treated by antiseptic tamponade will seldom require ligation as the tampon, if the wound remains aseptic, is allowed to remain until the lumen of the vessel has become obliterated permanently by thrombosis and cicatrization.

Internal Hemorrhage.—The prompt and proper treatment of internal hemorrhage will constitute one of the crowning triumphs of surgery upon the battle-field. The direct treatment of the injured vessels by early invasion of any of the three large cavities of the body will be the means of saving many lives which heretofore were doomed to certain death. This part of the surgeon's work will be done at the first dressing station or the field hospital.

What can be done behind the fighting line in such cases to bridge over the time until such services can be rendered to the injured? In hemorrhage from the intracranial vessels caused by bullet wounds, it would be dangerous to plug the wounds of entrance and exit as the accumulation of blood in the cranial cavity would result in death from cerebral compression. The escape of blood should be favored by inserting into the track made by the bullet a strip of aseptic or iodoform gauze. This will not only serve a useful purpose as a capillary drain, but by bringing in contact with the injured vessels an aseptic foreign substance the spontaneous arrest of hemorrhage by thrombosis is favored. The gauze drain should

FIG. 7.—Elastic constriction of upper extremity. (After Seydel.)

be secured on the surface of the wound with a safety pin and the wound or wounds protected against infection by an antiseptic dressing retained in place by the triangular bandage. By this treatment many cases will reach the field hospital for a timely intracranial operation. In bullet and stab wounds of the chest, complicated by hemorrhage from the intercostal arteries, the antiseptic tampon is the proper treatment. Packing of the tubular wound with an antiseptic hygroscopic material will not only succeed in arresting the hemorrhage, but will serve at the same time as an efficient capillary drain and protect the cavity of the chest and its contents against infection. In hemorrhage from injuries of the organs of the chest, firm circular compression of the chest directly over the wound already protected agaiust infection by an antiseptic dressing constitutes a valuable indirect hemostatic measure.

Immobilization of the chest wall by circular compression diminishes the functional activity of the lungs, and in doing so exerts a favorable influence in arresting hemorrhage from this organ. The cartridge belt or gunstrap can be used to the greatest advantage in limiting the respiratory movements of the chest. I believe that this conservative treatment of penetrating wounds of the chest will yield better results than injection of filtered air, absorbable aseptic solutions, or treatment by rib resection, free incision, and attempts to ligate the bleeding vessels. In penetrating wounds of the abdomen the prime indication in the future treatment of such injuries will be to prevent death from hemorrhage. Visceral wounds of the abdominal organs, notably the liver, spleen and mesentery, usually give rise to profuse and often fatal hemorrhage. The hemorrhage is more frequently venous and parenchymatous than arterial. In my address last year before this Association, I urged the importance of early operative interference in such cases, and mentioned hemorrhage and the direct treatment of visceral wounds as ample indications to justify prompt, active interference. In in-

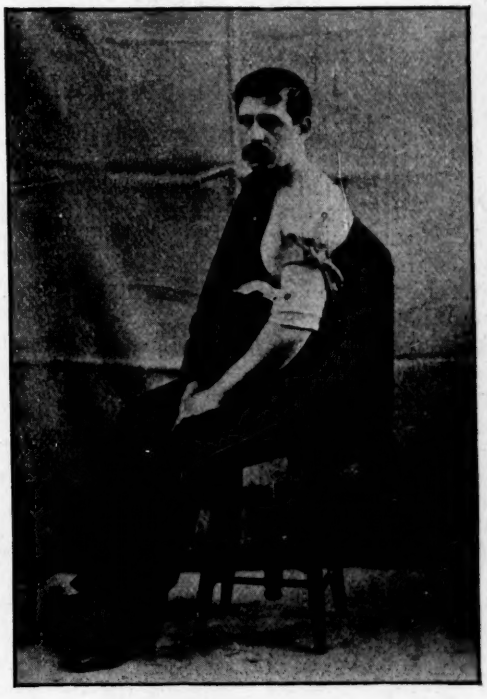

FIG. 7 a.—Suspender constriction of arm.

juries of vessels below the bifurcation of the abdominal aorta, attempts should be made to prevent death from hemorrhage upon the battle-field by resorting to the use of some sort of compression with a view to interrupting the circulation in the aorta above the bleeding point. Esmarch's method, shown in Fig. 11, can be extemporized in a few moments, as it requires no instrument of special construction and meets the indications more completely than the various instruments devised for this purpose.

The method of Brandis is equally simple and efficacious. As hemorrhage from any of the vascular organs and large vessels of the abdominal organs requires prompt treatment, and as in large engagements a considerable length of time will necessarily intervene between the first aid and the permanent arrest of hemorrhage by laparotomy, and as in many instances the location of the wound is outside of the range of successful treatment by compression of the abdominal aorta, it appears to me that in such cases

it would be good treatment to resort to direct and circular compression as has been described in connection with penetrating wounds of the chest. The wound of entrance and exit, if the latter exists, should be protected by an antiseptic dressing. Over the wound corresponding with the yielding part of the abdominal wall a large compress which may be composed of a compress made of a blanket, an article of clothing, a cartridge belt, or canteen should be

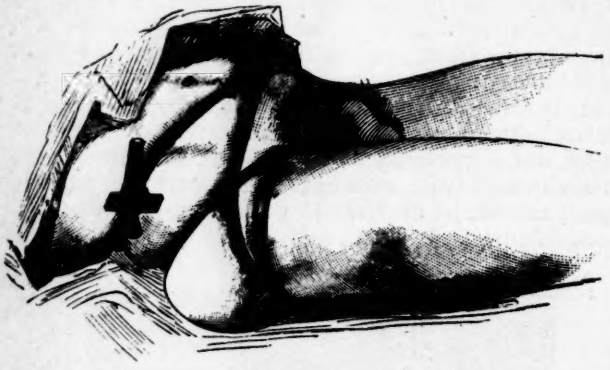

FIG. 8.—Elastic constriction of lower extremity. (After Seydel.)

placed and over it firm circular compression made with a belt or gunstrap. The direct compression made in the direction of the track of the bullet will do much toward diminishing the vascularity of the underlying injured parts, while the circular compression will immobilize the abdominal wall at the seat of injury and limit the movements of abdominal organs, conditions which can not fail in materially diminishing the risks of hemorrhage and in aiding thrombosis, nature's resource, in effecting spontaneous arrest of hemorrhage.

FIG. 8 a.—Elastic constriction of thigh.

PERMANENT HEMOSTASIS.—*Forcipressure.*—The best and most successful military surgeon is the one who accomplishes the most with the least number of instruments. Complicated instrument cases look well and make a favorable impression upon laymen, and can be used to advantage in a well-equipped hospital; they are out of place on the battle-field. The fewer the instruments in the treatment of emergency cases, the less the danger of infection. The writer has recently devised an operating pocket case which contains all the instruments a military surgeon is expected to use when in active service. It contains among the instruments needed for emergency work seven hemostatic forceps, by the use of which he is in a position to meet the emergencies incident to hemorrhage upon the battle-field. The use of aseptic hemostatic forceps upon the battle-field will meet the indications successfully in many cases in which other hemostatic measures are inapplicable. If the bleeding vessel is so located that it can be grasped with hemostatic forceps, but can not be ligated without performing a formidable operation, the forceps should be allowed to remain and should be incorporated in the antiseptic dressing and a note made to this effect on the diagnosis tag.

FIG. 9.—Antiseptic tamponade of wound of deep palmar arch.

Ligature.—Ligation of blood vessels, arteries and veins will usually be done upon the battle-field after temporary hemostasis by other means, either at the first dressing station or, more frequently, at the field hospital. Silk is the proper ligature material in military service. Silk can be sterilized repeatedly by boiling and is, consequently, a much safer material than catgut in emergency practice. Aseptic silk in an aseptic wound invariably becomes encysted. Catgut sterilized in Boeckmann's sterilizer and kept ready for use in sterilized envelopes, as advised by Boeckmann, could be made serviceable for military surgery. As a rule, the vessel should be tied at the seat of injury by enlarging the existing wound and using it as a guide to the injured vessel. Cases,

however, will present themselves in which it is impossible to apply this rule, and where the artery has to be tied in its continuity in a more accessible place on the proximal side of the bleeding point. Antiseptic precautions in the treatment of wounds and the employment of the aseptic ligature will materially diminish, if not entirely overcome, the risk of secondary hemorrhage, which proved such a terror to the surgeons, and such a frequent source of danger and death to the injured during the great War of the Rebellion. The ligature should never be tied sufficiently tight to rupture any of the tunics of the vessel. All that is necessary to obtain an ideal permanent obliteration of the vessel is to approximate and hold in uninterrupted contact the intima. If the vessel requiring ligature in its continuity is a large one, a double ligature with a bloodless space between the two ligatures is preferable, as the space interposed between them offers the most favorable conditions for an early and permanent obliteration of the lumen of the vessel. Under aseptic and antiseptic precautions the ligation of large veins is as safe a procedure as ligation of the accompanying arteries.

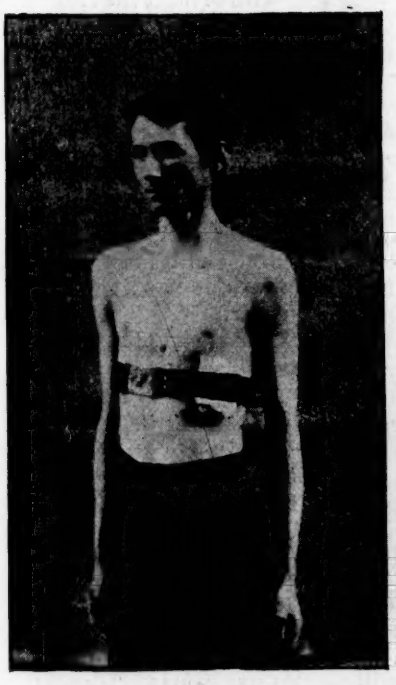

FIG. 10.—Treatment of penetrating wound of chest by antiseptic tamponade and immobilization by circular compression.

Vein Suture and Lateral Ligature.—In small wounds of large veins, lateral ligature and suturing with fine silk or catgut secures permanent hemostasis with preservation of the lumen of the vein, and for these reasons should receive in this kind of vein injuries the preference to ligation in continuity. This method of treatment receives particular value in the case of wounds of the superior longitudinal sinus and the large veins at the base of the neck in the axillæ and the groins, as well as the large veins in the abdominal cavity. The lateral ligature is applied by seizing the margins of the vein wound with a sharp tenaculum and tying the base of the cone with a fine silk or catgut ligature. In suturing of vein wounds the margins are inverted toward the lumen of the vessel in the same manner as in closing an intestinal wound by Lembert's sutures.

Hot Water and Styptics.—Hot water at a temperature of 120 to 130 degrees F. coagulates the albumin upon the surface of the wound and in doing so seals the orifices of small vessels, and on this account has become a popular hemostatic in arresting parenchymatous bleeding in parts and organs accessible to this method of treatment. The employment of styptics in arresting hemorrhage, on the whole, should be discountenanced, as their use interferes with an ideal healing of the wound. Their application can only come in question in the treatment of bleeding wounds of the mouth and pharynx where antiseptic tamponade is impracticable.

Saline Infusion.—Patients who have become debilitated by hemorrhage to the extent of endangering life, require restoration of a normal degree of intracardiac and intravascular pressure by saline infusion. Transfusion of blood, whole or defibrinated, has been proved clinically and experimentally a failure in preventing death from the immediate and remote results of dangerous hemorrhage. The transfused morphologic elements of the blood do not retain their vitality and are destined to be removed from the receiver sooner or later, by elimination through some of the excretory organs. von Bergmann and others have shown that the immediate cause of death from acute hemorrhage, subnormal intracardiac and intravascular pressure can be avoided more successfully by substituting for animal or human blood a physiologic solution of common salt.

FIG. 11.—Compression of abdominal aorta. (After Esmarch.)

Every field outfit should be supplied with a definite quantity of salt from which the solution can be prepared in a few moments when required. Szumann's solution is the one usually preferred. It consists of:

Natr. chlorat	6.0
Natr. carbon	1.0
Aq. distillat	1000.0

The chloride and carbonate of soda in the above proportion should be carried in every pannier so as to be available in all cases in which a saline infusion may become necessary. The simplest apparatus for making a saline transfusion is a glass or hard rubber funnel with two or more feet of rubber tubing and a small glass tube with a tapering point. The median basilic vein is usually selected for making the injection. The vein is exposed by a small incision after having rendered it turgid by proximal compression in the same manner as in performing phlebotomy, After exposure of the vein it is incised transversely.

and the point of the glass tube is inserted and fastened in place by a ligature previously inserted. Before inserting the glass tube the precaution is taken to fill it and the rubber tube with the saline solution to prevent the introduction of air. The saline solution to be used should be heated to the temperature of the body and infection is prevented by using only sterilized water for the solution.

The quantity of solution to be used to fulfill the therapeutic indications will vary from 500 to 1,500 grams, 1,000 grams being a fair average dose, and for the preparation of which the necessary quantity of powder should be kept in readiness. If the symptoms of improvement which follow the employment of a saline infusion should come to a standstill or disappear, it may become necessary to repeat the intravenous injection in the course of an hour or more. The same object gained by intravenous injections of salt solution is attained more indirectly and with greater loss of time by copious hypodermatic and rectal injections.

(To be continued.)

MODERN URETHROSCOPY AND CYSTOSCOPY —CATHETERIZATION OF THE URETERS AND INTRAVESICAL REMOVAL OF TUMORS.

Read in the Section on Surgery and Anatomy, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7-10, 1895.

BY FERD. C. VALENTINE, M.D.
NEW YORK.

Even those who have not gone very deeply into the recent literature of genito-urinary surgery, can not fail to be impressed with the correct idea that the title of this paper encompasses more than can be said in the time allotted at any meeting. Indeed, the title suggests volumes, conjures up visions of a very large library and actually covers a vast experience on the part of those who have given special attention to this most important branch of the healing art. The greater portion of this experience can not be written, for it depends upon practice of the hand and eye. For these reasons this paper can practically be little more than a demonstration of instruments.

I beg leave to divide this demonstration into four parts, omitting historical considerations entirely.

1. *Modern Urethroscopy.*—The instruments I have the privilege of showing are:

The Posner urethroscope is the simplest form of those now in use. It is practically a prolongation of the old meatoscope, except that it has no obturator and has a tube eight and one-half centimeters long. It is of glass, silvered within and blackened without. It is made in two forms; one with the tube vertically cut off, the other terminating obliquely. In practice, after being lubricated, preferably with glycerin, it is inserted into the urethra and any moisture obstructing vision is dipped out with either metal or wooden applicators wound with absorbent cotton. The illuminating source for the use of the Posner urethroscope may be either a head-mirror and lamp, or gas, or an electric light thrown in at the top of the funnel.

While the Posner urethroscope is necessarily limited in use by its inevitable shortness and other causes to be mentioned later on, it is certainly a very useful substitute in circumstances in which more extensive apparatus is not at hand. One case is vividly before my mind in which it served as well as any more complicated instrument possibly could have done. It was shown me last winter by Dr. Arthur Lewis, Professor Posner's assistant at the Berliner Allgemeine Poliklinik. This patient had had a urethral discharge for eight years following an attack of urethritis. All manner of treatment proved unavailing. The patient, an artistic designer, had fallen into that mental depression we so frequently find associated with and resultant upon affections of the genito-urinary apparatus. The man's mind was certainly in a state of decided melancholia. The first attempt at illuminating the urethra revealed a superficial ulcer about one centimeter long by half a centimeter wide, situated about five and one-half centimeters behind the fossa navicularis. Two applications of silver nitrate a week apart, sufficed to entirely cure the case.

Grünfeld, of Vienna, devised an urethroscope about one-fifth longer than Posner's. It differs also in being of metal, blackened within and having an easily removable obturator.

The Casper urethroscope is a more extensive apparatus, based, however, essentially upon the same optical principles as are nearly all other instruments for urethral exploration. The tubes are of metal and longer than those designed by Posner; they have an obturator and at their visual end have a rim fitting into a handle, provided with an ingenious arrangement of condensers and prism by which electric light is reflected into the urethra. This entails quite a weighty handle, which I do not doubt will be remedied in the future by its designer.

One objection to the use of this instrument is that it must be learned. The beginner is obliged to exclude reflexes and to overcome the hazy mist which at first presents to his vision, and only when he has overcome these can he see the urethra.

The requirement of a light, easily manageable handle, seems to have been anticipated in William K. Otis' most cleverly devised urethroscope. It has been recently described in several journals, and therefore need not be again discussed here. With no desire to sin on the score of excessive patriotism, I can not but be pleased with the marked evidences of American ingenuity Otis' instrument presents.

Posner, Grünfeld and Casper use wooden "Tupfer" for the purpose of removing excessive moisture from the field of vision. These "Tupfer" consist of "wood wire," which is nothing but the sticks drawn for matches, but not cut into match length. Cotton wound around their ends, complete this part of the apparatus.

The instrument, however, which seems to cover all the requirements of modern urethroscopy, is the Nitze-Oberlaender urethroscope. It consists, essentially, of a battery which provides light urethral tubes of various calibers and a light-carrier which is inserted into these tubes.

By means of the light-carrier, the source of illumination is placed at the points to be examined, thus fulfilling the essential requirement, in obedience to the law that visual acuity is in proportion to intensity of illumination. It must be self-evident that the nearer the object to be seen is to the source of light, the more clearly it is perceived. To enable the urethra to hold an unprotected electric light within it, an ingenious arrangement of two small

tubes allows a current of cold water to flow around the light. Kollmann, of Leipzig, experimentally determined that in the first thirty seconds after insertion of the light, the temperature of the urethra rises one and a half degrees and there remains stationary. This gives no discomfort whatever to the patient. A simple rheostat governs the amount of light required in each case. The only objection which can be properly urged against this instrument is that excessive moisture can not be dipped from the urethra except by previously removing the light-bearer. This, however, is so trifling a matter, that it hardly merits serious consideration.

The space occupied by the light-bearer in the urethral tube is so small that it practically does not obstruct vision. Moreover, the light being within the urethra at the very tip of the tube, enables the use of a much longer instrument; indeed, there is no difficulty whatever in using the ordinary Oberlaender tubes for examination of the posterior urethra, practically a species of cystoscopy.

Since Nitze devoted his remarkable genius more to the development of cystoscopy, from which so many astonishing things have arisen, some of the profession concluded that urethroscopy was thereby condemned as a mere scientific diversion. But Oberlaender showed that the urethra is still a most important organ, fully meriting the profound study he gave it. The improvements he wrought led to a recognition of the pathologic significance of the details, such as gaping gland orifices, changes in color, lack of striation, smoothing out of folds in the mucous membrane, etc., and made it possible to view intelligently that bugbear of specialists, chronic gonorrhea. The far-reaching results of gonorrhea, both to the patient himself and to women, need but be mentioned here.

If Oberlaender had done nothing else than describe urethral pathology, modify the Otis dilator and offer further methods for the treatment of urethral diseases, the merit of his work would be incalculable. At a proper time I hope to enter more fully into the details of this matter, which can be but sketched here.

2. *Cystoscopy.*—It is too late in the scientific day to discuss the value of cystoscopy. No one can deny that visual exploration of the interior of the bladder is of incalculable diagnostic advantage beyond palpation with tactile instruments. The instrument which Nitze devised has a very short beak, consisting of a removable Edison mignon-lamp. This is attached to the shaft, immediately beyond where it has a prism adjusted with such optical neatness as to throw the illuminated image directly into the line of vision.

The optical arrangement of lenses within the shaft and at the visual end of the Nitze cystoscope, are calculated to give a clear image, not only of the vesical mucous membrane, but also of neoplasms as well as stones within the bladder. Several cases present themselves to memory in which stones were so encapsulated or held by trabeculæ that even the most delicately managed sound could not reveal them. They could readily be located by means of the cystoscope.

In renal diseases, however, the cystoscope is of surpassing importance. The fact that a patient passes blood or pus from the kidneys with the urine, by no means indicates whether the right or left kidney is diseased. Watching the mouth of the ureters through the cystoscope, will show which kidney extrudes the vitiated urine and thus save unnecessary nephrotomy. One case especially, among those in which I had the pleasure of assisting Nitze, demonstrated the extraordinary value of cystoscopy. This was an apparently healthy, vigorous man, who occasionally passed bloody urine. The surgeons who had explored his bladder found no cause for this symptom. Palpation of the renal regions revealed nothing. At one time, when the patient bled, his bladder was cystoscoped and it was found that the blood came from the right ureter. An exploratory operation at first exposed no kidney; search revealed that its lower pole was *above* the upper margin of the twelfth rib, rendering palpation impossible. On drawing down the organ and removing it, it proved to be three times its normal size. Microscopic examination showed it to be carcinomatous in all its parts. When I left Berlin on April 9, the patient was making an eventless recovery. Were this the only case of the kind, it would suffice to establish the very great importance of cystoscopy for diagnostic purposes.

The one opportunity for error in cystoscopy lies in the possibility of exaggeration. The optical apparatus necessarily magnifies, and therefore when the tip of the instrument is too far removed from the point or object under examination it appears enlarged. This, however, may also be advantageously employed in determining the character of a pathologic product or foreign body. How clearly these are visible is well shown by the beautiful pictures in Nitze's "*Kystoskophotographischer Atlas.*" These were taken by his photographing cystoscope.

The technique of cystoscopy is very simple, albeit wearisome. Very few cases can be properly prepared and examined in less than half an hour. The bladder is washed with a boric acid solution until the wash water flowing out through the catheter is perfectly clear; this may require a very long time. Then the bladder is filled with 100 to 250 grams of boric acid solution and the cystoscope, being sterilized and lubricated with glycerin is inserted in the same manner as the Mercier catheter is used. In sensitive cases the insertion of the cystoscope may be preceded by an injection of cocain in a weak solution. By then gradually advancing the rheostat of the light battery a sufficiency of light is obtained. Rapidly turning on the light endangers the lamp, which from excessive current may suddenly burn out and require an entire repetition of all the steps of the procedure.

Several modifications of the Nitze cystoscope have recently been placed upon the market. Among these Lohnstein's with a doubly curved beak, appears to unnecessarily increase the intravesical length of the instrument and to make the distance between the point examined and the prism too great. Winter's cystoscope for the female bladder is merely a shorter cystoscope than Nitze's.

3. *Catheterization of the Ureters.*—When Dr. Max Nitze, of Berlin, claimed priority in successful catheterization of the ureters in the male in No. 9 of the *Centralblatt für Chirurgie* for 1895, he reserved for himself a discussion of the present and future diagnostic and therapeutic value of urethral catheterization. In view thereof, and in view of the magnificent work done by Howard A. Kelly, of Baltimore, little beyond a demonstration of the instruments remains to be said here.

Kelly's and Pawlik's methods have rendered catheterization of the ureters in the female rather easy. But the efforts made in the male by Brenner, Poirier and Boisseau du Rocher, have by no means proved executable with any degree of security.

Nitze's cystoscope for catheterizing the ureters, roughly described is a small-sized (Charrière 19) cystoscope running through and easily turning in a larger tube. The latter is open at the outer angle of the knee of its Mercier bend. Near the visual end of the outer tube a small, short one enters it. This is just sufficiently large to permit the catheter or sound for the ureter to pass through it and the larger tube, from the tip of which it can be protruded. It is inserted into the bladder closed entirely. When in place, the knob on the outer rim, indicating as with other cystoscopes, the position of the beak, the inner tube, or small cystoscope which contains the lamp and prism, is pushed forward, and the whole apparatus turned until the mouth of the ureter is clearly seen through the visual end. The catheter is then propelled by the fingers until its point enters the mouth of the ureter. This is the most difficult part of the whole procedure. Once accomplished, the catheter can be easily pushed into the ureter, on toward the pelvis of the kidney. Then holding it firmly in place, cutting off the light, drawing the inner cystoscope into the outer tube, the metal part of the apparatus can be withdrawn, leaving the catheter in the ureter, projecting through the bladder and the urethra. In normal cases the urine, free from vesical secretions, will then spurt or drip from the orifice of the catheter, two to five drops every minute, minute and a half, or two minutes.

Incidentally it may be mentioned here, that the inner tube, before described, can be used for cystoscoping children's bladders.

Casper's cystoscope for catheterizing the ureters is a somewhat more complicated and heavier instrument than Nitze's. Its beak is doubly curved, somewhat like Lohnstein's modification of Nitze's instrument. The lamp and terminal prism are considerably larger than Nitze's, for which the author claims a wider visual field. The ocular end of the shaft has an extra set of prisms in the optical apparatus, which places it beneath the shaft. Thus the opening directly into the shaft is left free for the entrance of the catheter. When it has penetrated the ureter to the desired degree, a bit of rubber tubing at the orifice of its entrance is removed. Then a ring at upper part of the instrument is drawn toward the operator. It is attached to a thin metal slide, which forms the upper third of the catheter canal. On removing this entirely, the catheter is held by the ureter above; the part lying in the bladder is then freed and supporting the end projecting from the meatus, the cystoscope is withdrawn. Thus the catheter is left *in situ*.

4. *The Intravesical Removal of Tumors.*—Unfortunately, through circumstances unnecessary to relate here, the manufacturer of Nitze's instruments could not provide me with an operating cystoscope in time to demonstrate it at this meeting. I am therefore obliged to crave your indulgence for being compelled to use a drawing, which, at best, is an unsatisfactory substitute.

It is a cystoscope with wires to snare off tumors within the bladder. The wire can be used cold, by mere constriction, or it can be rendered incandescent to sear as it strangulates. The tip of the instrument has a small platinum coil which can be rendered incandescent also, and thus used to cauterize the bases of tumors, arrest hemorrhage, etc. The instrument also has diminutive forceps, by which small fragments of tumors, or stones, or other foreign bodies can be grasped and withdrawn.

Other genito-urinary instruments and procedures, not being within the scope of this paper, I shall take pleasure in demonstrating privately to those interested. Among these are Nitze's irrigation and lithotomy cystoscopes, Oberlaender and Kollmann's urethral instruments, Janet's intravesical injector without a catheter, for the treatment of gonorrhea, and many other new genito-urinary devices.

This being the first occasion which I have had to publicly express my gratitude for many special attentions shown me in Germany, it affords me great pleasure to convey most sincere thanks to the eminent genito-urinary specialists there for all they did to advance my studies. I must mention particularly among these gentlemen, Prof. Carl Posner, Dr. Max Nitze, Dr. Leopold Casper, Dr. Hans Wossidlo, Dr. Arthur Lewin, Dr. Ernest R. W. Frank, of Berlin; Dr. Arthur Kollmann, of Leipzig, and Dr. F. M. Oberlaender, of Dresden.

THE RADICAL CURE OF HYDROCELE.

Read in the Section on Surgery and Anatomy, at the Forty-sixth Annual Meeting of the American Medical Association, at Baltimore, Md., May 7–10, 1895.

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The only known method of effecting a certain, absolute and permanent cure of a hydrocele, is to bring about the complete obliteration of the cavity of the tunica vaginalis.[1]

The methods usually employed by surgeons at the present time for the radical cure of hydrocele, are the injection method and the method by open incision. The treatment by injection fails in some cases, from the fact, no doubt, of its being improperly or poorly done. Again, it often fails in cases of very large hydrocele, and invariably in cases in which there is much thickening of the tunic, thereby preventing perfect collapse of the same.

Treatment by iodin injection is usually painful, and is attended with intense swelling and tenderness of the scrotum. Three to five days must be spent in bed, and three or four weeks are often necessary for perfect recovery.

Injection of carbolic acid is, in my experience, less painful and more efficacious, but requires about the same length of time for a cure.

In the operation by incision, as usually practiced and as described in the text-books, an incision about two inches long is made along the anterior surface of the tumor, which thoroughly opens and drains the sac. The edges of the tunica vaginalis are stitched to the skin by catgut or silk sutures, and a rubber drainage tube is inserted, or the cavity is packed with gauze.

The after treatment consists in a daily dressing, when the tube is gradually shortened or the packing is renewed. The patient must remain in bed for ten or twelve days, and eighteen to twenty-eight days or

[1] Treves.

more are required for a cure in most cases of operation by incision.

I wish now to describe, briefly, a method which I have employed for two or three years past, in my service in the Mary Fletcher Hospital and in private practice. I consider it almost unnecessary to say, at the present day, that the operation must be done aseptically.

The usual incision, two to three inches in length, is made along the anterior surface of the tumor, taking care always not to injure the testicle. The fluid is allowed to escape and the sac is irrigated. The margin of the tunic is stitched to the skin by six or eight black silk sutures. I use black silk, as it can be more readily found and removed. The interior of the sac is now irritated over every part of its surface by being rubbed with the finger tips. This is not done roughly, but gently and thoroughly. The sac is packed with strips of iodoform gauze, the usual dressings applied and the patient kept in bed. At the end of twenty-four hours the strips of gauze are removed and the cavity is irrigated. The entire surface of the tunica vaginalis will now be found to be covered with inflammatory lymph. Further packing or drainage is not used.

The opposing surfaces of the sac are now brought into thorough coaptation by compression, applied by means of strips of adhesive plaster. A light dressing of gauze is placed over the wound of incision and the adhesive strips are applied systematically around the scrotum over this dressing, so as to produce firm and even compression. The dressing should be inspected occasionally at first to see that it does not become loosened. If it does so, it must be reapplied at once. At the end of four or five days the dressing is taken off and the silk sutures removed.

At this time the cavity of the sac will be found to have been obliterated, the opposing surfaces having united by adhesive inflammation. Should a sinus be found, which, however, has happened but once in any of my cases, it should be treated on general principles and allowed to heal from the bottom. The wound is again dressed and mild compression continued. Two or three more dressings are all that are required, and at the end of six to twelve days the wound will be entirely healed. A slight dressing may be necessary for a few days to prevent chafing, and a suspensory should be worn for several weeks.

The strips of gauze used for packing should be counted and a note made of the number, to avoid the possibility of one of them being left at the time of the first dressing. But little swelling follows the operation, and I have seen no cases in which orchitis has supervened. The patient need be kept in bed but three or four days, but the scrotum should be suspended whenever he is allowed to get up.

Case 1.—George W., age 54, carpenter by trade, was admitted to the Mary Fletcher Hospital with a history of double hydrocele having existed for ten or twelve years. Both had been tapped several times. On Oct. 16, 1894, I operated on him under ether, in the manner described. The left hydrocele contained a pint of fluid and the right more than a pint. The case was dressed the next day, when the packing was removed and the surfaces of the sacs were brought together and held in apposition by a well-fitting dressing. This was left five days and on October 22, six days from the time of operation, the case was again dressed and both sides were found entirely healed, excepting the incisions through the scrotal tissues. There was no pus. Dressed again on October 24, or the eighth day, and the patient allowed to go home as he resided in the city, with instructions to return in four days. He returned as directed on October 28, when both incisions were found entirely healed, and he was discharged cured—twelve days from the date of operation. He went to work at once at his trade, having lost less than two weeks' time. At the present writing he is perfectly well, with no sign of a return of the trouble.

Another case of single hydrocele containing a half pint of fluid was operated on by the same method nearly two years ago, and was well in six days, and no sign of a return of the hydrocele up to the present time. In one case, a small sinus was found at the second dressing, which was one inch in depth and a little larger than a good-sized probe. This closed perfectly in three or four days.

Every case operated on thus far, by this method, has been successful.

The advantages claimed for this operation over any other, in all cases of old or large hydrocele, are the shorter duration of the treatment, together with the probability of a radical cure in every case.

The treatment by the injection method requires a long time for the restoration of the parts to their normal condition, while at the same time the result is uncertain, for the reason that the inflammatory process set up by the injection may not be sufficient to produce a cure. On the other hand, it may be so severe as to cause extreme swelling and much suffering.

The special objection to the open incision method is the long duration of the treatment. The patient must remain in bed from six to twelve days, which time measures the duration of the treatment by the method I have described.

This method is, I believe, applicable to all cases requiring an operation. It is not open to the objection that the patient must take an anesthetic, for if there is any special reason why he may not do so, or if he will not submit to it, the operation may be done with cocain.

RECENT INVESTIGATIONS UPON THE POISONOUS PROPERTY IN EXPIRED AIR.

BY HANNAH B. CLARK, (UNIVERSITY OF CHICAGO).

"Expired air consists chiefly of watery vapor, carbonic dioxid (CO_2), and organic matter. CO_2 in large quantities is a deadly poison, and popular opinion looks upon this as the dangerous element in foul air. But specialists do not deem the CO_2 even in the worst ventilated rooms really dangerous. . . .

"What then constitutes the danger from foul air? It is the organic matter present in it. The lungs and skin exhale a powerful poison. The quantity is very small, but where two or three persons are together in a confined space, it is sufficient to infect the air quickly. While the exact nature of this organic matter is a subject of dispute, it is evident that the human miasma is the really dangerous element in expired air. . . . .

"The amount is generally proportional to the amount of expired air, and the CO_2 measures the amount of expired air. Hence, the CO_2, although comparatively harmless itself, is a good index of the impurities of the air."[1]

In this extract from Dr. Burnham's admirable monograph we have a clear statement of the position taken by physiologists in the second stage of the discussion regarding the toxicity of expired air, the view which appears in almost every work on hygiene

[1] Outlines of School Hygiene, W. H. Burnham, Ph.D. Pedagogical Seminary, June, 1892, pp. 22, 23.

published within the last five or six years. During this time, however, continued investigation has furnished us with a body of new evidence which is so weighty and, on one point so decisive that it involves an entire re-statement of the case. To this end a review of the course of discussion seems called for.

The "popular opinion" to which Dr. Burnham refers, that looks upon CO_2 as the dangerous element in expired air, is but the conservative survival of what, in the first phase of the investigation, was the general scientific opinion. In searching for the cause of those phenomena so common in crowded, ill-ventilated rooms—headache, fainting, nausea, etc., the earliest students of the problem naturally had their suspicions directed to the one conspicuous element of expired air whose poisonous properties, when in large quantities, were well known, and carbon dioxid continued to bear this odium until experiments showed what a small amount of the gas is present in even the most impure air. Any evil effect from it seemed impossible and, as its presence did not explain the phenomena under consideration, some other poison must be sought.

In 1870, Ransome published his studies of "The Organic Matter of the Human Breath,"[2] which led the way in a long series of investigations. Ransome tested the breath for free and organic ammonia and estimated the organic matters given off in twenty-four hours at 0.2 gm. or 3 grs. He found in the breath, cells of various kinds, portions of epithelia, etc., and concluded that "they simply show the readiness with which the aqueous vapor of the breath ferments or putrifies, and the consequent danger of over-crowding, and the paramount importance of ventilation."

More practical experiments were made by Hermans[3] in 1883, when he attempted to answer the question, whether there is in inhabited rooms an accumulation of combustible material which leads to evil results, and whether, if a gaseous organic matter is exhaled, it is harmful. He reached the conclusion that sound men breathe out no appreciable amount of volatile organic matter. By another series of experiments in which he placed a man in an air-tight chamber and examined the air from time to time, he found that unpleasant symptoms appeared when the CO_2 rose to 3 per cent. His attempts to discover some trace of organic matter in the fluid formed by condensed exhalations were fruitless.

This negative result was an incentive to further studies of the same question, such as those of Uffelmann,[4] who determined the amount of CO_2 in atmospheric air at from 3 to 4 parts per 10,000. Since Hermans' experiments placed the danger point for CO_2 at 3 per cent., and other investigators had reported less than 100 parts per 10,000 in the worst ventilated rooms, the evidence seemed to be conclusive that CO_2 is not the dangerous element. Uffelmann also states that it is not the infallible test of the toxicity of the air that it had been assumed to be, for he often found it low when the latter, *i. e.*, when the organic matter was high.

Into the midst of these partially negative discussions with their lack of finality came certain statements from Brown-Séquard and d'Arsonval[5] which aroused the keenest interest because of their apparent decisiveness.

These investigators had obtained a sort of solution of expired air both by pouring water into the bronchial tubes of an animal and withdrawing it after it had mixed with the air from the lungs, and by condensing breath. With the liquid thus obtained they injected rabbits and dogs, the doses varying from 4 to 25 grs. The resulting symptoms of illness differ only in intensity according to the increase in the dose. They were invariably, dilation of the pupils, quickened respiration, paralytic weakness and variations of temperature, followed in extreme cases by death. After death the venous blood was found to be red. These results led the writers to conclude that, "the lungs of men, dogs and rabbits, in a healthy condition, produce an extremely energetic poison. . . . It is extremely probable, if not certain, that this is the toxic agent which renders confined air dangerous."

The poison, they said, is probably a volatile alkaloid, "leucomaine," judging by its extreme alkalinity, its persistence after heating to boiling in a closed vessel, and the resemblance between the phenomena caused by injections of condensed breath and those caused by other alkaloids.

There was an immediate attempt made to obtain results which would corroborate those of Brown-Séquard and his fellow worker. Dastre and Laye[6] succeeded in producing the same symptoms in animals, but only when they injected very large quantities of the fluid, and they afterward found that a similar quantity of pure water produced the same effects!

Entirely negative results were reached by Lehmann and Jensen,[7] and also by Hoffmann-Wellenhof.[8] No trace of the alkaloid could be discovered.

Brown-Séquard and d'Arsonval returned no direct answer, but a little later in the same year they reported a still more striking series of experiments in which they employed the so-called ventilation method. A number of rabbits were confined in glass cages so connected that only the first animal received fresh air, each of the others being obliged to breathe the exhalations of those preceding it. The death of the animals took place in regular order, beginning with the one farthest from the fresh air. Moreover, they stated the amount of CO_2 present at any time was very small, not more than 1 or 2 per cent., and when a tube of sulphuric acid was placed between any two cages, the rabbit beyond it, farthest from the source of air, lived.

All of these facts they regarded as greatly strengthening the theory of a volatile organic poison, since the small amount of CO_2 could not cause death, and the security of the animal which received its air through H_2SO_4 pointed to a probable union of the alkaloid and the acid.

This second challenge to investigators was taken up as quickly as the first had been. The vexed question seemed on the point of solution. Its confirmation was apparently given by Merkel[9] who in 1892 repeated Brown-Séquard's experiments. Trying first the method of injection, he failed as the other would-be verifiers had done, but when he used the ventilation method his confirmation of the earlier results

[2] Jour. Anatomy and Physiol. 1870.
[3] Archiv f. Hygiene. Bd. I, Heft 1.
[4] Arch. f. Hygiene Bd. VIII.
[5] Comptes Rendus, January, 1888.
[6] Comptes Rendus, 1888.
[7] Arch. f. Hygiene, Bd. X.
[8] Weiner Klinische Wochenscrift, Dec., 1888, No. 37.
[9] Arch. f. Hygiene, Bd. XV.

appeared complete. There were the deaths in the same order, with the same exception in the case of an animal protected by the H_2SO_4, and the same small amount of CO_2. The remark that the symptoms of illness could not be distinguished from those of carbonic acid poisoning is apparently made by Merkel as an observer rather than as a logician. He ignores it in his conclusions.

Merkel next followed out the suggestion as to a basic substance, and attempted to unite it with various acids, sulphuric, hydrochloric and acetic. After passing expired air through the acid he evaporated the solution and injected the sediment into rabbits. Only the most transient symptoms of disturbance followed.

The conclusion was therefore drawn that the organic poison exists,—as proved by the test of caged rabbits breathing expired air; that it is a base, as Brown-Séquard believed, and that it loses its toxicity when it enters into combination with an acid.

For a time the position thus taken by Merkel and Brown-Séquard and d'Arsonval was unassailed, and their view was even incorporated in the current works on hygiene as of final authority. But the doubts had not all been laid; they were repeatedly revived by other observers who wished to see the proofs in their own laboratories, until the accumulated evidence entirely altered the aspect of the question.

Benu, like Lehmann and Jessen, obtained only negative results from injection. With the ventilation method there was a repetition of the phenomena Merkel had seen, but there were also several obvious causes which rendered unnecessary any reference to an obscure poison. Excessive moisture, sudden changes of temperature, and lack of oxygen were the factors which explained all the effects. Without ignoring the organic matter present, Benu considered it too small in amount to cause any trouble, and he found no proof of a specific poison.

Thus far all the control experiments had been with animals, but Haldane and Smith[10] now made a valuable contribution to general knowledge in the record of investigations made with human subjects. They constructed an air-tight chamber in which the subject remained from seven to twelve hours at four different times. In the first two experiments the CO_2 increased from the normal to 5.8 per cent. and 6.39 per cent. In the second two the CO_2 was absorbed and reached only 0.6 and 1.4 per cent. General discomfort, quickened respiration and a headache on coming out were the symptoms experienced by the subject in the first two; in the last two only the slightest discomfort. In no case was an odor perceptible in the chamber at the close of the experiment, though it had been occupied for hours.

In order to estimate the relative part played by excessive CO_2 and insufficient O, another series of tests was made which showed that the diminution of O had comparatively little effect, since hyperpnoea began when the CO_2 reached about 5 per cent. whether the amount of O was greater or less than the normal.

The conclusions which the authors draw are of interest:

1. "The immediate dangers from breathing air highly vitiated by respiration arise entirely from the excess of carbonic acid and the deficiency of oxygen, and not from any specific poison.

2. "The hyperpnoea is due to excess of CO_2 and is not apparently affected by the corresponding deficiency of O. The hyperpnoea begins to appear when the CO_2 rises from 3 per cent. to 4 per cent. At about 10 per cent. there is extreme distress.

3. "Excess of CO_2 is likewise the cause, or at least one cause of the frontal headache produced by highly vitiated air.

4. "Hyperpnoea from defect of O begins to be appreciable when the O in the air breathed has fallen to a point which seems to differ in different individuals. In the case of one of ourselves the hyperpnoea became appreciable at about 12 per cent. and excessive at about 6 per cent."

In a later experiment[11] the same observers repeated the ventilation tests of Merkel, but only to conclude that "these experiments are distinctly against the theory that a volatile poison, other than carbonic acid, exists in expired air."

The amount of CO_2 was larger than that found by Merkel, and the presence of an absorption tube produced no effect; that is, there was no union of the acid with the hypothetical base.

The latest testimony on the subject of a volatile poison is presented by Rauer,[12] who, at the suggestion of Professor Flügge, undertook to repeat the work of Brown-Séquard and d'Arsonval with the most careful exclusion of all possible sources of error. Like Haldane and Smith, he found that the CO_2 in the cages was far in excess of that reported by Brown-Séquard, a fact which throws suspicion upon the latter's air-pump or tubing. He also failed to agree with the latter as to the effects of H_2SO_4. The absorption tube was no protection to the animal whose air supply came through it. Furthermore, the rapid recovery of the animals when the experiment was stopped was very different from the behavior of those poisoned by any known alkaloid. On the other hand, all the symptoms were those of carbonic acid poisoning, and direct proof that death was caused only by the CO_2 is afforded by the fact that when an animal breathed through a tube containing KOH, which removed the CO_2, it continued perfectly well.

Finally, the amount of organic matter present in expired air corresponds so closely to that in atmospheric air that it can not be looked upon as of any appreciable importance, even if a slight excess exists.

In this work of Rauer, we have the last reported investigations of the question under discussion. Taking these in connection with the conclusions reached by Benu and the many other observers who sought to verify Brown-Séquard's results, we may confidently affirm a final judgment on one point—the theory that there is a volatile organic poison in expired air is ruled out of court; it will not be questioned again in the face of such overwhelming denial. But the problem still remains, What is the poisonous property in badly ventilated rooms which renders the air dangerous?

There is general agreement among investigators that until the amount of CO_2 rises to 3 per cent. or 4 per cent. no harm results. But the worst ventilated rooms show less than 1 per cent., therefore it can not be responsible for those phenomena of crowded rooms which are commonly ascribed to bad air. Whether long continued exposure to air containing an excess

[10] Jour. of Path. and Bact., October, 1892.

[11] Jour. of Pathol. and Bact., February, 1893.

[12] Zeitschr. f. Hygiene u. Inf., Bd. XI, Heft. I.

of CO_2 above the normal, even if it be below the danger limit, affects in any way physical well-being, is a question too elusive to be easily answered, if indeed it admits of an empirical answer.

The suggestions which have been recently made regarding the cause of the phenomena in question tend toward the view that no single cause, but rather a combination of causes is to be expected, and that these may possibly be related to the physical condition of the air quite as much as to its chemic com position.

In a crowded, ill-ventilated room, several abnormal factors are to be noticed. Aside from the excess of carbonic dioxid, there is an increase of moisture, a very considerable rise of temperature, and, very often, unpleasant odors, some of them due to bodily uncleanliness. All of these must receive consideration in the further study of the practical problem, and be weighed both alone and in combination.

The difficulties in the way of these complicated experiments, increased as they must be by attention to the subjective element, the nervous strain felt by sensitive persons in a crowd, are so many that no complete solution of the question can be looked for in the immediate future. We may, however, hope to learn something definite about the effects of temperature and cleanliness, factors which have a very direct bearing upon the efficiency of all systems of ventilation.

Two recent series of investigations on subjects allied to the one discussed above contain some interesting suggestions. In the *Centralblatt für Bakteriologie*, February, 1894, Alessi reports certain experiments which he has made on sewer gas as a predisposing cause of typhoid infection. He found that the animals which breathed sewer air, a mixture of various gases, were rendered peculiarly susceptible to infection, but that no one of the gases taken alone produced any effect, nor, most significant of all, did an artificial mixture of the more familiar gases of decomposition such as H_2S, CH_4, NH_3, etc. He apparently failed in some way to reproduce all the elements of natural "sewer gas."

Geilmuyden, (*Arch. f. Hygiene*, Bd. XXI, Hft. II) who studied the products of illuminating gas, asserts that the poisonous properties of air in crowded rooms are certain, but that chemically they can not be shown or determined.

By a study of animals he reached the same conclusion that Haldane and Smith, Hermans and others had reached, that CO_2 is not dangerous until it amounts to 3 per cent. or 4 per cent. Illuminating gas increased the CO_2 in well-ventilated rooms 0.2 per cent. to 0.3 per cent.; in badly ventilated rooms 0.6 per cent. to 0.7 per cent. The gas increases the moisture slightly, the temperature very considerably. And the latter part he regards as a very significant one in considering the injurious influence of the air.

SOCIETY PROCEEDINGS.

Association of American Medical Colleges.

Sixth Annual Meeting, held at the Club House of the Hotel Rennert, Baltimore.

(*Continued from page 1014.*)

It is my opinion that medical jurisprudence should be taught during the third or fourth years of the four years' course. It should be a compulsory study, including at least thirty-two hours of time. The instruction can best be afforded in lectures and recitations. It should not include toxicology, except from a legal standpoint. A few hours can, with profit, be spent in the laboratory in a study of blood in its medico-legal aspects. I would suggest that instruction include work in the following topics in the subjoined order:

HISTORY OF MEDICAL JURISPRUDENCE.

Legal procedure, the coroner's jury; the justice or municipal courts; the grand jury; the trial court; the court of review or supreme court.

Evidence, witness of fact; witness of opinion or expert; dying declarations.

Phenomena and signs of death; molecular death; somatic death; causes of death; signs of death; medico-legal investigations in cases of death; the post-mortem etc.

Presumption of death; presumption of survivorship; personal identity; the causes producing violent death; examination of blood stains; burns and scalds.

Death in different forms of asphyxia; from suffocation; from strangulation; from hanging; from drowning.

Death by lightning; death from heat and cold; death by starvation; death from poisoning; toxicology.

Toxicology from a medico-legal standpoint; malingering; pregnancy; criminal abortion.

Infanticide; legitimacy; inheritance; rape; insanity; medical malpractice; civil malpractice; life insurance.

DR. N. S. DAVIS, Dean and Professor of the Practice of Medicine Chicago Medical College, presented the subject of

THE HISTORY OF MEDICINE AND MEDICAL ETHICS.

The importance of a more systematic study of the history of medicine and its relations to all other coincident branches of human learning through the past centuries, is well illustrated by the following saying of Hippocrates: "The physician must know what his predecessors have known, if he does not wish to deceive both himself and others."

Having delivered a course of lectures to the senior class in the Northwestern University Medical School, each of the last three years, on the history of medicine and medical ethics, I am more than ever before convinced that the subjects named are of so much importance that they should be placed in the curriculum of a medical school. They should be taught with a reasonable degree of thoroughness. Guided by my own experience, I am induced to think that a fair discussion of the origin, progress and more important events pertaining to the history of medicine can not be given in less than fifteen or sixteen lectures or lessons of one hour each.

SYLLABUS OF WORK.

Lecture 1. All the earliest historical and mythological data prior to, and at the time of Hippocrates; between the fourth and fifth centuries, B. C.

Lecture 2. The characteristics of Hippocrates and his works, and their relations to co-existing systems of philosophy and religion.

Lecture 3. The progress of medicine from the death of Hippocrates to the establishment of the Grecian or Alexandrian School and Library, to the overthrow 100 B. C.

Lecture 4. The effects of the Roman conquests, and the transference of medical institutions to Rome and their progress to the time of Galen about 200 A. D.

Lecture 5. Medical progress from the death of Galen to the overthrow of the Roman empire; the establishment of Arabian medical schools, to the return of medicine with the Saracens to Europe, covering a period of ten or twelve centuries.

Lecture 6. The reëstablishment of medical schools at Salerno, Bologna, and other points in Europe, from the thirteenth century to the end of the fifteenth century, during which chemistry and anatomy became distinct branches of science, and the arts of printing is discovered.

Lecture 7. Progress of medicine during the sixteenth and seventeenth centuries, with the influence upon it of the thirty years of religious wars.

Lecture 8. Progress during the eighteenth century—the era of medical theories and dogmas, as well as of scientific discussions.

Lecture 9. The important discoveries and progress during the first half of the nineteenth century.

Lecture 10. The condition and progress of medicine and medical institutions in the American colonies from their settlement to the close of the War of Independence.

Lecture 11. The progress of medicine and of medical institutions in the United States.

Lecture 12. Progress in the development of minute anat-

omy, pathology, etiology and experimental therapeutics, closing the second half of the nineteenth century, and its relation to coincident progress in the other departments of science.

Lecture 13. The important discoveries and their application in all practical departments of medicine, during second half of the nineteenth century.

Lecture 14. The present status of the science and art of medicine and surgery, the effect of its segregation into specialties, and the principles that should guide our efforts for future progress.

Lecture 15. A candid statement of the origin and distinctive characteristic features and claims of homeopathy, Thompsonianism, eclecticism, physio-medicalism, etc., which still remain as an eighteenth century excrescence or dogmas in the domain of medicine.

In presenting a fair discussion of medical ethics, I have found it necessary to give four lectures, to-wit:

Lecture 1. The origin of medical ethics, including the Hippocratean oath, the volumes by Thomas Percival in 1803, and the framing of the American Code by the National Medical Convention in 1846 and 1847.

Lecture 2. The adoption of the American Code by the AMERICAN MEDICAL ASSOCIATION and nearly all the State medical societies. The duties of the physician to his patient and of the patient to the physician.

Lecture 3. The Code as applied to the relations existing between physicians and to the profession at large.

Lecture 4. The Code, defining the duties of the physician to the public and of the public to the profession, with the explanatory preamble and resolutions appended thereto, with such comments may be deemed proper.

The most appropriate place in the medical course of study is the fourth year, and certainly not earlier than the third year; as the more advanced the student is in the current medicine of the day, the better he will appreciate all that relates to its past history; and the more certainly it will guard him against entertaining extravagant ideas of the importance and permanence of the popular doctrines and practices in which he is being educated.

We would recommend as the minimum amount of work for four years, courses to consist of eight months each as follows:

For the third year men, thirty recitations, twenty didactic lectures, ten practical lessons in physical diagnosis, and three review examinations.

For the Seniors (that is for the fourth year men) we recommend thirty recitations, twenty didactic lectures, ten lessons in practical physical diagnosis, thirty clinical lectures, and three review examinations. Although we have recommended this as a minimum, we think it would be a fair average. There would be no objection to adding a few more hours if other subjects permitted.

The work of the Juniors should comprise recitations on physical diagnosis, and on all of the common diseases of the heart and lungs, and didactic lectures on the more important diseases of the thorax.

The work of the Seniors should comprise recitations on practically all of the diseases of the thorax, except those of very rare occurrence, with didactic lectures on all of the principal diseases, and clinical lectures on such cases as might be presented. Practical physical diagnosis would necessarily have to be much the same for the two classes, but the Juniors should study thoroughly the normal chest. By this arrangement all subjects are gone over twice in one way or another, and we believe it necessary that they should be so considered, in order to fit the men for work as general physicians. We have not specified the particular diseases, thinking it would require more space than you would care to devote to this branch, but we will do so if it is your desire. Respectfully submitted,

E. FLETCHER INGALS,
Chairman Rush Medical College.

DR. HENRY P. BOWDITCH, Professor of Physiology at Harvard Medical College, said, on the subject of

PHYSIOLOGY.

I feel much hesitation in undertaking the work you have asked me to perform; since no one person can have an adequate idea of the conditions under which medical instruction is taught in various medical schools of the country. An ideal course of instruction should be arranged so as to bring the instruction in physiology subsequent to that of anatomy; but this is rarely, if ever, possible, owing to the small number of subjects which can be properly taught the first year. With regard to this, the fifth point in your circular letter, I would say that, in my opinion, it would be unwise to make any general rule to regulate the practice of medical schools with regard to giving credit for work done in other schools. Each school should judge of this for itself. It seems that the object of this committee will be secured if the aid of various national societies of specialists is invoked. The preparation of a syllabus of lectures in physiology, for instance, could be intrusted to a committee of the American Physiological Society, and if indorsed by the society would command the confidence of the various medical faculties of the country. A result would be reached more slowly by this way but it would, I think, be worth waiting for.

DR. ROSWELL PARK, of New York, discussed the subject of

BACTERIOLOGY.

Basing the following plan upon a four years' course of not less than eight months each, my suggestion would be as follows: I think that bacteriology ought to be taught in a way differing from that in which it is at present generally taught, and I would divide the subject in accordance with these views. During the first year, when the men are doing their preliminary work on the fundamental studies—at the time, in other words, when they are studying anatomy, physiology and biology, which I assume they are also to be taught—I would have systematic instruction in cryptogamic botany, devoted in a large measure to morphology and the classification of the various forms of vegetable life, with which they will later have to become more familiar as disease germs. This instruction at such time would be essentially didactic, with illustration by diagrams and, if possible, by a certain amount of acquaintance with the appearance of these minute forms of life through the microscope. This didactic instruction should be partly by the way of lectures, partly by way of recitation, and might profitably consume eight or ten hours of actual work. Incidentally, I would put in also instruction upon the lowest forms of animal life—the sporozoa, etc. This might possibly be done before they take up the other forms of animal life which are parasitic, that is, the entozoa.

During the second year, or at such time as the men are taught organic chemistry, and along with the study of the alkaloids, or in appropriate places, I would have instruction inserted, concerning the ptomaines and other poisonous alkaloids which are the products of bacterial life; and, again, when they are dealing with the albuminoids, I would insert so much as can be taught with any definiteness about the albuminoid poisons of the same origin. This would require a careful arrangement of these and their insertion at proper points, with a reference backward to morphologic studies and a strong impetus forward in the direction of a practical application of what they have learned during these two years, which should come in during the fourth year in the way of laboratory investigation.

I am taking it for granted that teachers in the various departments who have to deal with infectious diseases would make, now and again, the statement that such and such a disease is due to such and such an organism, and would give such demonstration of this as they might see fit. This would be both an illustration of the importance of remembering the isolated facts already gathered, and would serve to keep the student alive to the importance of such knowledge.

It would be difficult to assign a definite number of hours to this work in organic chemistry *in toto*. I should say that at least three or four hours ought to be devoted to this particular part of the work during the season's instruction in chemistry, perhaps more.

Finally, during the fourth year, I would have courses of practical instruction in a bacteriologic laboratory, arranged to last at least six weeks, preferably eight, during which at least three hours of continuous work should be devoted to this each day, this to be like laboratory instruction in other respects. The men should be taught to make the culture media, and to go through all the various manipulations which are included in the study of bacteriology. They should be taught to differentiate between different forms, and to recognize pathogenic organisms; and at least a certain amount of work upon living animals should also be insisted upon. They should also be taught the use of the microscope in the recognition of bacteria and their differentiation, as well as their detection in various morbid products—sputum, urine, etc.

It seems to me that in this way, men would go out from college, not experts, but intelligent scholars, having already in their possession the knowledge which would incite them to further study, or at least make them intelligent readers and students.

First year. Instruction in cryptogamic botany and morphology.

Second year. Instruction in the chemistry of the bacterial products.

Fourth year. Laboratory exercises and instruction in the cultivation and detection of the bacteria, and methods of experimental study.

DR. HOWARD KELLY, Johns Hopkins Hospital, said, on the subject of

GYNECOLOGY.

(*One hundred hours.*)

1. Gynecology is a specialty and not one of the fundamental branches. If it is to be mastered, this must be done by post-graduate study. The time recommended is sufficient to give a general practical knowledge, but not to fit a man to perform any important operations. This time should be divided about as follows: Didactic lectures, thirty hours; clinical instruction, thirty hours; touch course, fifteen hours; pathologic laboratory demonstrations from recent specimens, fifteen hours; recitations, ten hours. One hundred hours in all.

2. These lectures should be arranged as follows: Topographical anatomy, two; gynecologic examination, two; diseases of external genitals and operations, eight; diseases of urinary system, four; diseases of uterus, tubes and ovaries, general principles of gynecologic operations, after-treatment of abdominal cases, fourteen. Total, thirty.

3. This branch should be given the last year with other special branches.

4. No special preliminary studies are necessary, except such as are naturally included in a well-arranged course with thorough teaching in anatomy and pathology.

5. I consider an examination the only proper method of admitting men to advanced standing. If the standard is high, this is but fair to the other students.

7. Topograhical anatomy, two lectures. General principles of gynecologic operations, two lectures.

Touch course of ten hours. Examination of normal pelvic organs: vulva, vagina, uterus, tubes, ovaries, broad ligaments, urethra, bladder, ureters, anus, rectum, sigmoid flexure. Two lectures; fifteen hours practice.

Minor gynecology and diseases of vulva, vagina and cervix: inflammatory, neoplasms, cysts, lacerations, fistulæ. Eight lectures.

Diseases of urethra, bladder and ureters: inflammatory, strictures, fistulæ, calculi, neoplasms, cysts. Four lectures; four hours clinical instruction.

Diseases of uterus, tubes, ovaries and broad ligaments: inflammatory, neoplasms, cysts. Ten lectures.

After-treatment of abdominal cases. Two lectures.

NOTE.—Clinical instruction willl have to be given to the class as the material is available.

1. For satisfactory gynecologic teaching, the class should be divided into small sections of five and ten.

2. Not more than five should be admitted to a touch course at one time.

3. In didactic teaching, the whole class should be united.

4. It is important, as far as practicable, to establish the plan of teaching several minor gynecologic operations upon the cadaver.

Order of instruction: one didactic lecture weekly, thirty hours. Demonstrations from recent specimens in pathologic laboratory, one hour every second week, fifteen hours. (Touch course to class by sections throughout term, fifteen hours each.) Recitations, one hour every third week, ten hours. Clinical instruction, one hour weekly, thirty hours. Total, eighty-five hours. Adding touch course, fifteen hours; total, one hundred hours.

PROFESSOR VICTOR C. VAUGHAN, of the University of Michigan, presented a

SYLLABUS OF LECTURES ON HYGIENE—NOT INCLUDING BACTERIOLOGY.

(*Seventy-eight hours.*)

Part I.—Individual Hygiene.

Lecture 1.—Food, definition, classification.

Lecture 2.—Force value of foods. Cyclical changes in matter, actual and potential energy. Foods for plants. How plants obtain their carbon, hydrogen, oxygen, nitrogen, phosphorus and sulphur.

Lecture 2.—Food principles; water, inorganic salts, proteids, carbohydrates and fats. The amount of each food principle required by healthy persons daily.

Lecture 4.—The economic value of foods. The percentage composition of the most important foods.

Lecture 5.—The construction of diet tables for the healthy. Rations for prisonêrs, for workingmen, for students.

Lecture 6.—Meats. General statements concerning the use of meats as foods. Is man suited to an exclusive vegetable diet? This question is answered from the anatomic, physiologic, chemic and experimental data known.

Lecture 7.—Meats (continued). General rules which should govern the selection of meats. Digestibility and food value of meats from different animals. Influence of season, of previous feeding, of age, of exercise just before death, and of methods of slaughtering and dressing on the food values of meats.

Lecture 8.—Meats (continued). The transmission of animal parasites to man in meats. Trichinæ, echinococci, tæniæ.

Lecture 9.—Meats (continued). The transmission of bacterial diseases to man through the flesh of diseased animals. Anthrax, tuberculosis, foot-and-mouth disease, etc.

Lecture 10.—The inspection of animals before slaughtering. The hygiene of slaughtering houses.

Lecture 11.—Meats infected with non-specific toxicogenic germs. Historical review of cases of mass poisoning of this kind.

Lecture 12.—The examination of meats suspected of producing untoward effects. Chemic and bacteriologic examination.

Lecture 13.—Milk. Its physical and chemic properties. Adulterations. Detection of adulterations.

Lecture 14.—Milk (continued). Comparison of woman's and cow's milk. Changes in cow's milk to make it correspond more closely with that of woman. Infants' foods.

Lecture 15.—Milk (continued). A vehicle for the spread of tuberculosis, typhoid fever and other diseases.

Lecture 16.—The relation of infected milk to the summer diarrheas of infancy. The formation of poisonous ptomaines and proteids in milk.

Lecture 17.—Rules to govern the dairy farm, milking, the cooling and transportation of milk.

Lecture 18.—Sterilization and Pasteurization of milk.

Lecture 19.—Butter. Its food value. Methods of preparation. Influence of bacteria in the production of butter. Adulterations and methods of detecting the same.

Lecture 20.—Cheese. Methods of preparation. Action of rennet. Action of bacteria. Hygiene of the factory and curing room. Adulterations and methods of uetecting the same.

Lecture 21.—Varieties of cheese. Food value. Cheese poisons.

Lecture 22.—The starches and starchy foods. Their value. Their digestibility. Effects of excess of starchy foods. Digestion of cellulose. Fermentation in the intestines.

Lecture 23.—Sugars and syrups. Kinds of sugar. Distinctions. Commercial methods of preparation. Confectionery. Adulterations of sugars, syrups and confectionery.

Lecture 24.—The cereals. Their food value. Varieties. Wheat, rye, barley, corn, etc. Methods of conversion into foods. Ergotism. Maidismus, lathyrismus, tayopyrismus.

Lecture 25.—Flours and meals. Tests of the bread-making value of flours. Food value. Estimation of gluten contents. Food values of flours and meals.

Lecture 26.—Bread. Methods of making. The leavening of bread, with yeast, with baking powder, with compressed air and other gases. Adulterations of bread. Impure yeast. Adulterated baking powders. The use of coloring matters in cakes. Short weight loaves.

Lecture 27.—Fresh fruits and vegetables. Their food value. Scurvy, its history in the past, its occurrence at present and its prevention.

Lecture 28.—Dried and preserved fruits. Their preparation. Adulterations. Poisoning from canned vegetables and fruits. Jellies and their adulterations.

Lecture 29.—Condiments. The extent to which salt should be used in food. The use of pepper, mustard and spices. Their adulterations.

Lecture 30.—Non-alcoholic beverages. Coffee, tea, maté, cocoa, chocolate, etc. Their food value. Their stimulating effects. Active principles. Physiologic and toxicologic effects. Adulterations.

Lecture 31.—Alcoholic beverages. Fermented and distilled; cider, wine, beer, porter, brandy, whisky, rum, gin, liquers, etc. Percentage of alcohol. Other constituents. Food values. Adulterations.

Lecture 32.—Alcoholic beverages (continued). The physiologic and pathologic effects of alcohol. Its effects on digestion, the circulation, nervous system, etc. Its use in health and disease.

Lecture 33.—Baths and bathing. The necessity of frequent bathing. Excretion through the skin. The temperature of baths. The morning bath. The shower bath and cold plunge. The warm bath. Mineral baths. Sun bathing. Swimming as a means of exercise. The resuscitation of the apparently drowned.

Lecture 34.—Clothing. Fibers used in the manufacture of clothing. Silk, wool, cotton, flax, hemp and jute. The properties of each. Their durability and adaptability. Influence of season on clothing; color. The use of fur, leather and rubber as articles of clothing.

Lecture 35.—The adjustment of clothing. Advice to patients in regard to their clothing in various diseases, such as Bright's disease and tuberculosis.

Lecture 36.—Physical exercise. Its value. Pulmonary and systemic respiration. Oxygen in the blood is physiologically still outside of the body. It must be carried into the tissues and this can be done only by activity of the tissue. Kinds of exercise. Conditions necessary to make it of value.

Lecture 37.—Mental hygiene. Activity necessary to brain development. Mental work does not kill, worry may. Train the judgment. Take some line of work and make yourself master of every detail. Study must be begun early in life. One who takes up a new line of work after 40 is likely to make a failure of it. Methods of study. Hours of study.

Lecture 38.—Rest. Recreation. Physical rest. Mental rest. Change in work. Evidences of need of rest. Rest in sleep, in recreation and in work.

Part II—The Hygiene of the Family.

Lecture 39.—Healthful homes. The selection of a site. The nature of the soil and the surroundings. The construction of the cellar, the walls, the decorations of the walls, floors, carpets and rugs, doors, windows, etc.

Lecture 40.—The arrangement of the rooms. The living, sleeping and dining rooms. The pantry and kitchen. Closets. bath room, etc.

Lecture 41.—The heating and ventilation of residences. Heating with open fire, stove, hot air, steam and hot water. The inlets for fresh air and outlets for the foul. Patent systems of ventilating houses. Simple methods.

Lecture 42.—The disposal of excreta and garbage in villages and country places. Privy vaults, dry earth closets, cesspools. The disposal of kitchen waste. Private water supplies.

Part III—School Hygiene.

Lecture 43.—Location of the building. Hill and stair climbing good exercise. The size of rooms. Air space per student. Cloak rooms. Study and recitation rooms. Lighting, heating, ventilating, blackboards, etc.

Lecture 44.—School age. The kindergarten and its methods. The study of language and mathematics. Hours of study in school and at home. Methods of study and of teaching. The influence of school life on growth and health.

Lecture 45.—The diseases of school life. Myopia and various forms of nervous disturbance. The duties of teacher, parent and health officer when epidemics appear in schools. Disinfection of school rooms.

Part IV—Industrial Hygiene.

Lecture 46.—Diseases due to the inhalation of dust. Bronchial catarrh. Pulmonary emphysema. Bronchiectasia. Deposition in the lungs of coal dust, of finely pulverized metals, of sand, tobacco dust, etc. Influence of an atmosphere filled with dust on the digestive organs. Statistics.

Lecture 47.—Diseases most frequently observed among those who work in cotton, wool, silk, hair and feather manufactories. Among those working in glass factories, in ultramarine, etc. General rules for the protection of workingmen against dust inhalation.

Lecture 48.—Diseases common among those who work with poisons. Diseases of the respiratory organs. Diseases of the abdominal viscera. Phosphorus, arsenic, lead, zinc, mercury and antimony poisoning.

Lecture 49.—Working with organic poisons. Cyanogen compounds. Anilin and its derivatives. Carbolic acid. Poisonous plants. Animal poisons. General rules for the protection of these working men.

Lecture 50.—Special diseases of the skin as influenced by occupation, of the circulatory organs, of the muscles, bones, joints, of the nervous system, of the organs of special sense.

Lecture 51.—Injuries common in certain occupations. Mechanical and chemical injuries. First help to the injured. General rules for the special protection of parts of the body exposed to danger.

Part V—Municipal Hygiene.

Lecture 52.—Water supply. Sources. Cistern, surface and subterranean waters. The pollution of streams and lakes. The self-purification of rivers. The artificial purification of water; by subsidence, by precipitation, by filtration.

Lecture 53.—Waterborne diseases. Typhoid fever, cholera, dysentery.

Lecture 54.—The chemic examination of drinking water. The determination of sodium chlorid, free and albuminoid ammonia, nitrates and nitrites. The value of chemic analyses.

Lecture 55.—The microscopic and bacteriologic examination of drinking water. Objects found by microscopic examination. Methods of bacteriologic study. Counting the number of germs. Determining the toxicogenic properties of the germs.

Lecture 56.—Sewers. The single and double systems. The house connections. Traps, ventilating pipes, etc.

Lecture 57.—The disposal of sewage. Discharge into bodies of water. Sewer farms. The purification of sewage.

Lecture 58.—The disposal of garbage. Dumping into water. Burying. Burning. The utilization of garbage.

Lecture 59.—Streets, pavements, parks, public baths. The sanitation of tenements, lodging houses, places of amusement, etc. The sanitary inspection of buildings.

Lecture 60.—Sanitary supervision of the markets. Meat and milk inspection. The detection of gross adulterations.

Lecture 61.—The duties of the municipal health authorities. The notification of infectious diseases. Isolation. Disinfection. Sanitary police regulations.

Part VI—State Hygiene.

Lecture 62.—State sanitary service. State Boards of Health. Plans of organization. Duties. Relations to local and city boards. Comity between State and provincial boards. Inter-State notification of diseases dangerous to the public health.

Lecture 63.—The State Board of Health as an executive body, as an advisory board, and as a promoter of scientific investigations.

Lecture 64.—A State sanitary inspector, his duties and responsibilities. His relation to the Board of Health. A State analyst. The duties of such an officer.

Lecture 65.—The sanitary laws of different States. The means provided for their enforcement, etc.

Part VII—National Hygiene.

Lecture 66.—The National Health Service. Has our country any such service? What should be done in this direction by our government? History of national sanitary legislation in this country? In other countries?

Lecture 67.—What means are now used to protect against the importation of disease from other countries? Quarantine, disinfection, inspection. What should be done? Should the national government undertake scientific sanitary investigations?

Part VIII—The Influence of Climate on Health.

Lecture 68.—What is meant by climate? Comparison of climatic and local conditions? The geographical distribution of tuberculosis and the lessons to be learned therefrom?

Lecture 69.—The geographical distribution of diphtheria, scarlet fever and measles.

Lecture 70.—The geographical distribution of influenza, yellow fever, dengue and malaria,

Lecture 71.—The geographical distribution of typhoid, typhus, plague, etc. Lessons to be learned from these facts.

Part IX—The Hygiene of the Sick Room.

Lecture 72.—The prevention of the spread of the infectious diseases in private practice. The selection of the sick room. Its furniture. The nurse. Isolation of the sick. What must the physician do to prevent his carrying the disease to others?

Lecture 73.—Hospitals. Their location, construction, heating, ventilation, management, etc.

Lecture 74.—Contagious disease hospitals. Hospitals and sanitaria for special diseases, as smallpox, diphtheria, tuberculosis, etc.

Part X—Immunity.

Lecture 75.—Natural and acquired immunity. How is immunity secured? Vaccination; history and statistics.

Lecture 76.—Vaccination against anthrax, chicken cholera, swine plague, etc. Immunity secured by the chemic products of germs.

Part XI—Miscellaneous.

Lecture 77.—Military hygiene. The soldier. His clothing and food. The camp. Barracks. Hospitals, etc.

Lecture 78.—Marine hygiene. The ship. Its construction and ventilation. The food and clothing of sailors. The diseases and accidents to which they are specially liable.

Lecture 79.—The disposal of the dead.

DR. H. GRADLE, of Chicago, presented a paper on

OTOLOGY.

After comparison of the courses in otology in American and foreign medical schools, the undersigned would recommend as the minimum requirement: the daily attendance in small classes at a well-organized ear clinic or dispensary, where the students can closely examine the patients for a period of at least four weeks—or what amounts to the same thing, the distribution of the twenty-four clinical hours throughout a whole semester, and either in connection with this clinic or separately, a course of at least eight systematic lectures on diseases of the ear. The only conclusive evidence that a student has not merely attended this course, but profited by it, is his ability to examine clinically and interpret correctly when put in front of new patients.

Otology should not be taught before the third year, and it would seem more logical to have it follow the training in general medicine and surgery. It would be well to have otology follow a course in rhinology.

If the various colleges belonging to the Association agree on a standard of minimum requirements in any one branch, there is no good reason why a student who presents evidence that he has passed in this branch in an equivalent medical school should not get credit for his work. But if he comes from an institution which has not adopted the same standard, justice would require a re-examination. In otology, as well as in any other branch of clinical medicine, a practical test of the student's ability to form a diagnosis and prognosis, when placed before a series of patients, is a much more correct mode of gauging his knowledge than a theoretical examination.

DR. EDWARD L. HOLMES presented the report of the subcommittee on

OPHTHALMOLOGY.

This committee presents a syllabus of minimum instruction in ophthalmology, which it believes every medical college should provide for its students. It does not suggest, much less advocate, a course for the education of students in college as specialists; simply that they should study with care fundamental principles; that those, especially, who began practice in small towns and villages, may skillfully examine and treat the ordinary diseases and injuries of the eye in patients who are utterly dependent upon them for aid; that they may, without dangerous delay, advise intelligently, patients when to seek the skill of the specialist; that they may comprehend the structure and use of common optical instruments and appliances, and, finally, that they may be able to pursue advantageously after graduation this special study if they choose.

I.

During the last four months of the second year, one lesson a week should be devoted to demonstrations of the following subjects, in classes of not more than thirty students, under the direction of instructors in properly equipped laboratories.

1. The anatomy of all the tissues by means of human eyes and the eyes of animals, at least one eye being provided for each five students, and by means of microscopic preparations.
2. The physiology of each structure.
3. In the laboratory of medical physics, a study with appropriate apparatus of the primary principles of optics.
4. Reflection of light from plain, convex, concave surfaces, with a sufficient number of small mirrors for each student to perform all necessary experiments.
5. Refraction of light by media with parallel, plain, curved surfaces; by prisms and by convex and concave lenses, each five students being furnished with lenses and a small camera, filled with smoke, that he may make his own demonstrations.

Every student should be strictly required to study approved books in connection with the laboratory exercises, and be subjected to thorough examinations.

II.

For the fourth year·

1. One clinic a week through the year.
2. Sixteen didactic lectures, chiefly on the following topics: The cornea, the conjunctiva, the uveal tract, the optic nerve and retina, the lens, the lacrymal apparatus, the muscles, the lids, the orbit, with special emphasis upon purulent conjunctivitis, glaucoma, iritis, sympathetic ophthalmitis and myopia.
3. Review of the laboratory work of the second year in the reflection and refraction of light.
4. Fifteen hours devoted to practice in the use of the ophthalmoscope, with suitable artificial eyes; emmetropic, hypermetropic and myopic, with the eyes of patients and of the students themselves.
5. Examination by focal illumination.
6. Fitting glasses, tests for color perception and tests for malingering.
7. Study of gross pathologic specimens.
8. Although the class may have passed the general examinations in materia medica and therapeutics, students should be required to study in review, at least, the following list of remedies and to write upon the blackboard at the clinics and other exercises, prescriptions in proper form for diseases of the eye.

Four mydriatics: coca, boron, silver, copper. Two myotics: mercury, zinc.

In the opinion of this committee, no student in college should be exempt from the above courses, even if he shall have taken them previously in another college.

It will be observed that, in accordance with this syllabus, the number of purely didactic lectures is reduced to a minimum, and that the teaching is in a great measure by "manual training." With this kind of individual training, and with ample clinical observation, the study of a suitable book and regular recitations from it become a most important mode of instruction. By recitations, the student gains knowledge and retains it. Unfortunately, no book has been written which is fully adapted to the requirements of this syllabus.

It is assured in this report that the college curriculum extends through four years, with a term of study each year of eight months.

Kentucky State Medical Society.

Abstract of the Proceedings of the Fortieth Annual Meeting, held at Harrodsburg, June 12, 13 and 14, 1895.

(*Continued from page 1016.*)

DR. FRANK C. WILSON, of Louisville, read a paper entitled

THE DANGERS OF CHLOROFORM ANESTHESIA, HOW TO AVOID AND OVERCOME THEM.

The frequent occurrence of death during the administration of anesthetics forcibly impressed upon us the dangers incurred and the importance of a careful review of the subject. Dangers may arise: 1, from impurity in the anesthetic used; 2, from administering it to improper subjects, or to those not properly prepared; 3, from administering it in an improper manner; 4, if accidents occur, the danger will be vastly increased by a failure to detect the earliest indications and to properly institute measures of resuscitation; 5, danger is increased in proportion to the prolongation of anesthesia. As by far the greater number of deaths occur from the administration of chloroform, the author directed most of his attention to a consideration of the dangers incident to its use. Every patient should be carefully examined. The condition of the heart and lungs known, and that of the kidneys ascertained by a test of the urine. Simple uncomplicated disease of the heart does not necessarily preclude the use of chloroform, but ether is safer unless there be present bronchial inflammation, or disease of the kidneys. If there be found affections of the brain, chloroform is best. In the use of chloroform with the cone and with many of the inhalers it is impossible to estimate the amount of chloroform the patient actually inhales. It is not the amount of chloroform which has been poured upon the cone, but the quantity which has passed into the circulation which is the vital question. In order to obviate this difficulty the author has adopted a plan of vaporizing the anesthetic from an atomizer, the bottle being so graduated as to indicate, at a glance, exactly how much is being used. As chloroform is drawn into the inhaler or cone none is wasted, but all passes directly to the lungs and there can be no uncertainty as to the amount used. The author then dwelt upon the means of resuscitation when needed.

DR. J. H. BAUGHMAN, of Flat Lick, read a paper entitled "A Few Crumbs about Typhoid Fever."

Adjourned until 8 P.M.

SECOND DAY—EVENING SESSION.

The Society reassembled at 8 P.M. at the Harrodsburg Opera House, and was called to order by DR. J. N. BAUGHMAN, Second Vice-President.

Dr. A. W. Hitt, of Louisville, gave a lecture on "Leprosy," which was illustrated by means of the stereopticon. He stated that we were indebted to the Bible for the earliest reports of this disease. The popular belief that leprosy is a disease limited to the lower classes is not true. The author cited cases of kings and other members of the nobility who were afflicted with and died of the disease. There are 19,000 leper islands in all England; in France 2,000. These leper islands represented millions of cases of the disease. There were 522 cases of leprosy in the United States. One-tenth of the population of the Sandwich Islands had leprosy. The author then considered the anesthetic and tubercular forms of the disease.

Dr. Lyman Beecher Todd, of Lexington, was introduced, and delivered an eloquent, yet touching and impressive address entitled "A Generation of Kentucky Physicians—A Reminiscence." He graphically portrayed the great work that had been done by Gross, McDowell and others and paid eloquent tributes to them. He said the Kentuckians cherished their names and highly appreciated their contributions to medicine and surgery—contributions that were preserved in libraries and considered a precious inheritance. They were the shining stars of the medical firmament, and had practiced medicine and surgery so skillfully and successfully in small towns and hamlets that it made the past generation of Kentucky physicians worthy of remembrance and emulation.

Dr. Dudley S. Reynolds, of Louisville, followed Dr. Todd with an address entitled "The Ethics of the Medical Profession." This address was listened to with marked attention throughout its delivery. Among the various points brought out was this: that ethics must belong to the educated classes. It aims to establish the right conduct with respect to doctors themselves, and of their patients. He then alluded to the organization of the American Medical Association and its Code of Ethics, saying that the Kentucky State Medical Society was organized in 1851, at which time it adopted its code. The Kentucky State Medical Society admitted as members those physicians who were identified with local medical societies.

Adjourned till Friday, 9 A.M.

At the close of this session, the members, with their wives, daughters and friends repaired to the residence of Dr. A. D. Price, where a reception was held and a sumptuous repast served.

Third Day—Morning Session.

The first thing in order was the report of the Nominating Committee, which was read as follows:

To the President and Members of the Kentucky State Medical Society:—Your Nominating Committee beg leave to submit the following report:

For President, Dr. John A. Lewis, Georgetown.
First Vice-President, Dr. H. H. Grant, Louisville.
Second Vice-President, Dr. O. S. Kash, Moorefield.
Permanent Secretary, Dr. Steele Bailey, Stanford.
Treasurer, Dr. J. B. Kinnaird, Lancaster.
Librarian, Dr. Frank Boyd, Paducah.
Place of meeting, Lebanon, 1896.
Chairman of Committee of Arrangements, Dr. R. C. McChord, Lebanon.

On motion, the report was adopted.

Dr. A. D. Price read a paper entitled

Antepartum and Postpartum Hemorrhage.

The author portrayed the importance of the hemorrhage that antedates the completion of labor, and there remain to be considered those of no less import that follow. There is no other class of patients in which emergencies occur so suddenly, and which demand such prompt measures of relief as those that come under the obstetrician's care. The obstetrician should have fixed principles of conduct for every accident liable to be encountered and, banishing every doubt or hesitation, boldly employ them for the saving of life. Postpartum hemorrhage follows the birth of the child, and the loss of blood is from the placental site, or from torn or lacerated vessels in vagina or cervix, or from the ruptured uterus.

The third stage of labor requires the most careful management. Delivery of the placenta, as a rule, means great danger. Too early efforts in this direction exhaust the uterine muscles and favor relaxation. Those who had witnessed a severe postpartum hemorrhage could appreciate its seriousness. Prophylaxis can accomplish much and render these cases exceedingly rare. The patient should be carefully prepared for her confinement, the surroundings being made aseptic, and by having her bladder and rectum thoroughly emptied. A faradic battery, one pole being applied to the lumbar region, and the other over the uterus or within its cavity, rarely fails to produce prompt and efficient contractions, and should always have a place in the obstetrician's armamentarium.

The patient's general condition will require attention. If the loss of blood has been great and the shock is severe, lower the head, elevate the limbs, apply heat to the back of the neck and head, and give rectal injections of whisky and hot coffee. If the depression is very great, hypodermics of whisky in strychnia will be demanded.

Dr. John G. Cecil, of Louisville, followed with a paper entitled

Craniotomy, Symphysiotomy and Cæsarean Section.

Each of these operations has a place in obstetric surgery, and we may safely say that they are here to stay. The author believes that pelvimetry is a subject as yet little understood and still less practiced in this part of the country. It is the key to the situation in many cases demanding interference, for upon our estimation of the pelvic diameters depends the selection of the operation best indicated for relief. Craniotomy will always have its advocates, but that it must decrease while the other two must increase, is already a matter of history. Under aseptic precautions and in the hands of those familiar with the more formidable operations, it is probably the safest, that is, less destructive to maternal life, but in the light of modern surgical achievement it is not indicated upon the living child. It is indicated upon monstrosities, hydrocephalics and upon dead children; but not in any case of such extreme narrowing of the pelvic canal as would render the destruction of the child very certain, and delivery of the fragments destructive to the soft parts. Symphysiotomy is now generally admitted to be a perfectly justifiable operation. The limits are being more strictly defined as its scope is better understood. It will probably displace Cæsarean section in cases where there is only a relative indication. A proper case for it is one of occipito-posterior position which, either on account of a large fetal head or a small pelvic canal, can not be delivered by version or the forceps without such violence as would endanger the maternal structures and put the life of the child in great jeopardy. Multipara are better subjects than primipara.

Further indications for Cæsarean section are extreme cases of cervical or vaginal atresia and rupture of the womb with escape of the contents into the abdominal cavity. Considering the frightful fetal mortality, and the great risk to the life of the mother, Dr. Cecil is about prepared to say that placenta previa centralis constitutes a legitimate indication for Cæsarean section.

Dr. David Barrow, of Lexington, read a paper entitled

Extrauterine Pregnancy—Four Recent Cases.

The first patient was 34 years of age, married twelve years, mother of two children, one 12 and the other 9 years old.

Case 2 was a woman 28 years of age, married thirteen years: one miscarriage five years ago, no pregnancy since. In this case ruptured tubal pregnancy was diagnosed, and operation advised and performed.

Case 3, woman aged 30, married eleven years, two children living, one dead.

Case 4, woman aged 28, married five years, no children, had a miscarriage five months after marriage, and once since. She thinks she aborted at the second month.

These cases came under his care during the past five months. In all save one, the diagnosis was comparatively easy, and in every case the patient consented readily to the treatment proposed. To the prompt resort to surgery he attributes largely the successful results obtained. Extrauterine pregnancy is more frequent than is usually believed by the profession. Most physicians in active practice have met with these cases, and have often failed to recognize them, cause of death being attributed to idiopathic peritonitis or some other condition. Dr. Barrow believes and contends that more of these cases should be recognized before rupture, and if they were not put aside carelessly with the general opinion that they were cases of threatened abortion more accurate diagnoses would be made.

The treatment of extrauterine pregnancy is surgical. Electricity, injections into the sac, etc., are advocated by some, and cases are cured by these means, but he believes prompt resort to surgical interference is the only treatment worthy of consideration when the patient's consent can be obiained, and the physician is prepared to do such surgery. These patients do well after operation, if done early, and convalescence is usually rapid. We should open the abdo-

men, separate the adhesions, deliver and tie off the impregnated tube and its ovary as quickly as possible.

DR. J. W. O'CONNOR, of Elizabethtown, read a paper entitled

ACNE ROSACEA INDURATA PUSTULOSA,

in which he reported a case. The patient, a widow 32 years of age, a native of Kentucky, the mother of two children, called at his office to consult him in regard to a skin disease of the face. She gave a history of dyspepsia and constipation. The skin disease began about two years ago, soon after the death of her husband. She first noticed a few small pimples on the nose, which gradually spread over the nose and both cheeks, with a few on the forehead. Previous to this she would often have a flushing of the face, or hot flashes, and skin of the face was always greasy. Her face was covered with bright red indurated pustules, varying in size from that of a pinhead to that of a small bean, many resembling a bean in shape, nearly all containing some pus. The integument generally was very much thickened, and pressure upon it would move the entire cheek. The capillaries were enlarged, congested and tortuous. He began treatment by opening the pustules with a sharp-pointed bistoury and squeezing out the contents, then inserting a pointed stick dipped in Monsel's solution as a cautery and germicide. After opening the pustules, he sponged the face with a 5 per cent. solution of carbolized water. He interdicted the use of all soap, and recommended bathing the face in hot water night and morning, after which rub in with a piece of flannel a 3 per cent. solution of salicylic acid. At first this is to be mixed with three parts water, and gradually made stronger and stronger until it is used pure. He gives internally 1-10 gr. doses of calomel every hour for a few days, with a pill of aloin, strychnia and belladonna. These preparations are alternated every few days with sulphur tablets 1 gr. every two hours and tablets of iron 1 gr., arsenic 1-20 gr. and strychnia 1-30 gr. every four hours. Other remedies were recommended, but he had found none so efficacious as these. The after-treatment consists in the exhibition of a general course of tonics and the mineral acids or iron, cod-liver oil or arsenic, as seems best suited to the individual case in hand.

DR. ARCH DIXON, of Henderson, contributed a paper entitled "An Atypical Case of Appendicitis," which emphasized the necessity of early operation in all cases, whether they be acute, perforating, fulminating with general peritonitis, or acute suppurating, with local plastic peritonitis and abscess, or, in other words, as soon as the diagnosis is made, regardless of the favorability of the case. He believes appendicitis to be an infective exudative inflammation, septic in character from its incipiency. The very moment the appendix takes on inflammatory action it at once proves a soil rich in character, plowed, harrowed and in every way fit for the growth of septic bacteria. In a majority of cases, if operation be performed within forty-eight hours after the onset of the symptoms, the appendix is not yet ruptured, and can be removed without pus infection of the peritoneum, an advantage of which even the boldest surgeon is pleased to avail himself. In the latter stage, if the surgeon is fortunate enough to be called at the time that the peritoneum is flooded with pus and the patient collapsed, it is his duty to perform the operation, and give the patient a chance for his life in this forlorn condition. The rule, first, last and always, should be to operate in every case of appendicitis, promising or unpromising, at the earliest possible moment.

DR. T. C. EVANS, of Louisville, followed with a paper entitled "Adenoid Growths in the Naso-pharynx." In this paper the author desired to speak only of the abnormal condition of those masses of lymphoid tissue situated in that part of the respiratory tract, known and described as the naso-pharynx. Meyer, of Copenhagen, in 1868 was the first to describe this condition. The disease consists of an hypertrophy of the lymphoid tissue which encircles the naso-pharyngeal portion of the respiratory tract, blocking up the space and mechanically interfering with or altogether preventing nasal respiration. This hypertrophy usually involves, to a greater or less extent, the faucial tonsils and other contiguous lymphoid masses. The diagnosis is easily made from the characteristic symptoms. The treatment is either expectant or surgical. The expectant plan is at best long, tedious and uncertain, entailing years of suspense on the part of physician and parent, and subjecting the patient to dangers which, once encountered can not be corrected. Surgically, most operators now confine themselves to one of two methods: 1, removal by the post-nasal curette; and, 2, removal by post-nasal cutting forceps.

DR. T. M. GREENE, of Lexington, read a paper entitled the "Leucocytes in Diseases of Microbic Origin." The author said the older physicians explained the etiology of diseases generally by the term *materies morbi*, of which they had no very definite idea, believing that it represented certain poisons emanating from the earth and conveyed to the system through the medium of the atmosphere, water and food. They were aware, also, that the system under certain circumstances had the power of resisting disease, also of performing cures unaided by the efforts of the physician. This was expressed in the oft-quoted aphorism, *vis medicatrix naturæ*. It was reserved for the modern science of bacteriology to show that materies morbi are really living germs, which on entering the system become pathogenic in character; also that the power of cure resides really in the white corpuscles of the blood. While engaged in this important work they are called phagocytes. Before entering upon a discussion of the progress of phagocytosis, the author dwelt upon the peculiar nature of the leucocytes themselves. There were two principal indications for treatment of all diseases of microbic origin: first to destroy the germs as soon after invasion as possible, and at their point of entrance. Second, to overcome the effects of toxins after they had been formed.

DR. T. B. GREENLEY, of Meadow Lawn, read a paper entitled

THE PREVENTION AND TREATMENT OF PULMONARY TUBERCULOSIS.

It has been the observation of the writer for many years that the majority of cases of this disease are preceded by a longer or shorter period of impaired health, apparently due to indigestion and deficient assimilation. Especially is this condition presented in those who are constitutionally predisposed to the disease. The writer entertains the opinion that if proper means were instituted sufficiently early in these cases to restore them to their ordinary health, that the disease in the majority of cases might be prevented. The means indicated consist mainly in the use of proper diet and exercise in the open air, observing at the same time sanitary environment.

As to the treatment of pulmonary tuberculosis, a great deal can be accomplished in its earliest stages by the use of proper alimentation, or the building-up system.

Dr. Greenley then outlined the plan of treatment adopted by Dr. Carasso in treating this disease. From the record it appears that every case of primary tuberculosis treated by the inhalation method of Carasso recovered, and that the fatal cases with but two exceptions were ones in which secondary tubercular lesions produced death. The average duration of the treatment in these cases was sixty days. The simplicity and harmlessness of the method, together with the remarkably successful outcome of his cases (Carasso's), recommend the method for a thorough and systematic clinical test. Perhaps the most rational as well as the truly hopeful plan of managing pulmonary tuberculosis, is before it is fully developed. Preventive means are much better than curative, but both combined in some cases are better than either alone, in order to prevent further development.

Several of the papers on the program were read by title. After the appointment of delegates to the next meeting of the AMERICAN MEDICAL ASSOCIATION, the presentation and adoption of resolutions of thanks, the Society then adjourned to meet at Lebanon in 1896.

Colorado State Medical Society.

Abstract of the Proceedings of the Twenty-fifth Annual Meeting, held at Denver, June 18 and 19, 1895.

[Special correspondence of the JOURNAL.]

THURSDAY, JUNE 18.

The meeting was called to order by the President, DR. HUBERT WORK, of Pueblo. The reports of various officers and committees showed the society to be in a flourishing condition, with a slight net increase of membership during the past year and a balance in the treasury.

The Executive Committee reported a rule limiting readers of papers to fifteen minutes each, and remarks in discussion to five minutes, which rule being adopted and rigidly adhered to throughout the meeting, rendered possible the satisfactory completion of a full program, and added much to the success of the meeting.

"The Relationship Existing between the Eye and Diseases of the Brain," was the subject of a paper by DR. R. F. LE MOND, of Denver. He called attention to the intimate connection of these two organs, and its clinical importance. In a case of astigmatism it is the recognition on the part of

the brain that the eye is unable to properly and comfortably do its work, that gives rise to the train of symptoms usually set up. By nervous impulses sent out from the brain are brought about the irritation, congestion and photophobia that cause the closure of the eye and suspension of its work, the train of symptoms being designed to protect the organ from more serious injury. He also urged the great diagnostic value of optic neuritis, inequality of the pupils, optic nerve atrophy, and hemianopsia in cases presenting severe headache or other indications of organic disease of the brain.

"Observations regarding Eye Strain and its Relief" were presented by Dr. Edward Jackson, of Philadelphia. He pointed out that ametropia and eye strain were neither identical nor necessarily connected, that either might be present in high degree without the other, that the recognition of ametropia was not essential to the diagnosis of eye strain, and did not alone establish it. He also called attention to the severe symptoms often arising from comparatively slight errors of refraction, especially those remaining after inaccurate corrections, and after middle life, when the lowest degrees of hyperopia or astigmatism were most likely to tempt their possessor to undue exertion of the ciliary muscle. The period of adaptation, during which the best fitted glasses were likely to prove unsatisfactory, and which is not sufficiently emphasized in the books, was also referred to. It was essential that the patient be forewarned of its occurrence, or he would take it as evidence of failure on the part of his adviser to find the proper glass, and lose confidence, to the detriment of both himself and his physician.

"Inflammation of the Middle Ear with Involvement of the Mastoid." Dr. W. C. Bane, of Denver, stated that the majority of cases of pyogenic inflammation of the brain and its membranes were due to similar disease of the middle ear and mastoid. He reported five cases of such disease, four of which had required opening of the mastoid, and all had recovered. The first was in a man aged 59, who came for pain and dizziness. He had a small perforation in the drum membrane. Two months later he returned with a swelling below the ear half the size of a goose egg, and unhealthy pus escaping from the meatus. The removal of diseased tissue was followed by complete recovery. A man aged 27 suffered from acute purulent inflammation of the middle ear for about one month. There was a large perforation, but the mastoid became involved and rendered necessary the excavation of its entire contents. A young woman suffering from a subacute otitis media with a small perforation, the discharge having stopped, had tenderness and swelling over the mastoid requiring operation. In a boy with acute inflammation, involving the mastoid, the symptoms yielded without operation. In the fifth case, a man aged 41 with acute otitis media had severe mastoid symptoms which not being relieved by other measures, the mastoid was opened and showed that the process of disintegration had already begun.

"Laryngeal Infiltration" was the subject of a communication by Dr. P. F. Gildea, of Colorado Springs. He reported a case of severe tubercular infiltration, and pointed out that where there is much submucous tissue great infiltration occurs before there is ulceration, but where there is but little submucous tissue, ulceration takes place early.

Dr. E. T. Boyd, of Leadville, exhibited an improved snare for the removal of nasal hypertrophies, etc. The improvement consisted chiefly in the addition of a pin, arranged to slide upon the canula, with which the part to be removed could be securely transfixed before tightening the snare, preventing any slipping of the loop, or the dropping of the portion removed.

REFLEX IRRITATION FOLLOWING EYE STRAIN.

Dr. D. H. Coover, in illustration of the intimate relation existing between the eye and the brain and the remote effects liable to arise from eye strain, reported a series of cases. A school girl suffered from frequent attacks characterized by general convulsions. The correction of her compound hyperopic astigmatism entirely stopped these attacks. Subsequently she lost her glasses and went five days without them during which time she had four attacks. A girl aged 11 had seizures in which she became unconscious and convulsed. She had had seven such attacks. The examination of her eyes showed two diopters of astigmatism; she was given convex 1.50 D. for constant use. For three months she did not have a seizure. Then one occurred, her glasses were changed to a full correction, and she remained entirely free from attacks ever since. A young woman who had long been subject to nausea and vomiting, especially in the morning, was entirely relieved by the correction of her compound hyperopic astigmatism. A boy of 16, working hard at school, became affected with chorea. He was given correcting glasses, and recovered in a month. A man aged 45 had been for years troubled with a dry hollow cough, which was worse at night and worse when he was very busy. He obtained the greatest relief by going away from his business entirely. Examination of his eyes revealed compound hyperopic astigmatism. He was given correcting glasses, wore them all the time, and in three months was well of the cough.

Dr. G. Melville Black, of Denver, reported as "A Case of Angio-neurotic Edema of the Ocular Conjunctiva," the case of a man who was suddenly affected with great swelling of the conjunctiva and lids without other evidence of serious inflammation. The swelling passed away with equal rapidity. But very few similar cases were found recorded in medical literature.

Dr. John M. Foster, of Denver, exhibited a case illustrating the results obtained by "Blepharoplasty by Thiersch' Grafting." The patient had after traumatism a cicatricial contraction of the upper lid, drawing it completely away from the eyeball and preventing its closure so that the conjunctiva was suffering from continued exposure to irritants. Two operations were required. Some contraction having occurred after the first, the stitches uniting the lids after the second operation were left in place until the forty-eighth day. The result was an almost perfect restoration of the lid to its normal appearance and function.

DIAGNOSIS AND PRINCIPLES OF TREATMENT OF HIP-JOINT DISEASE.

Dr. John Ridlon, of Chicago, delivered an address upon this topic. He thought every physician should know enough about this disease, 1, to recognize it; 2, to understand the general principles of its treatment; and 3, to be able to recognize when it was fully cured. For diagnosis, the three early and constant symptoms are limp shrinking of the affected limb as shown by comparative measurements of the girth of the two thighs, and limitation of the movements of the joint in all directions. Other common symptoms are restlessness during sleep, with sudden crying out, particularly in the early part of the night; deformity, if the case has gone far enough; pain, which is not usually one of the early symptoms, and may be entirely absent; and abscess which is present in about 50 per cent. of cases. The differential diagnosis has to be made with reference to Pott's lumbar disease, sacro-iliac disease, congenital dislocation of the hip, and hysterical hip-joint. In the latter condition there is never any diminution in the size of the limb.

In treatment the object is to secure functional rest by preventing motion, and so far as possible removing pressure from the opposing surfaces of the joint. To prevent motion an apparatus must extend from close above the ankle to the armpits. To remove pressure the patient might be kept in bed. But this can not be continued throughout the treatment; so the only thing to do is to put a shoe on the sound limb with a heel high enough to take the weight all off the other. As to operation, he thought that the more experience the surgeon had with operating, the less was he inclined to operate. If by operation all diseased tissue could be removed, and immediate union of the wound secured, it would be right to operate. But incision and drainage were not justified; and aspiration and the injection of the abscess cavity with iodoform were not worth the pain and disturbance that attended them. In the diagnosis of cure the greatest caution must be observed. When all symptoms have been absent for six months you may think the case is getting well, but do not tell any one that you think so. Gradually relax some of the restraints of the limb, and if there is no tendency to relapse after some months give the patient slightly more freedom; and so continue until, after years of close observation of case, it may be concluded that the case is cured.

"The Treatment of Lateral Curvature of the Spine," was the subject of a paper by Dr. Geo. B. Packard, of Denver. He advised the relief of the weakened spine from the superincumbent weight, by rest in bed for a couple of hours in the middle of the day close watching of the general health, gymnastic exercises, and the support of a properly fitted jacket.

Dr. S. D. Van Meter, of Denver, urged the importance of circumcision. For very many it is needful, though some may not require it. If it were universally practiced health would be promoted, and venereal disease and reflex troubles diminished.

Dr. Chas. A. Powers, formerly of New York, but now of Denver, read a paper on "Cancer of the Rectum and its Ex-

cision by the Method of Kraske and Modifications Thereof," with the reports of four cases, of which three had recovered and one had terminated fatally. He believed there were but comparatively few cases that could be cured by operation through the perineum. He had in these cases used the operation of Kraske, but would in future try the more recently described osteoplastic method. In cases where it was intended to preserve the anus, preliminary colotomy was indispensable. The selection of cases proper for operation was very important; and where it was found that the disease had extended too far for complete removal the attempt should not be made; but a simple colotomy resorted to, when the obstruction rendered it necessary. All cases of possible malignant disease of the rectum should have early and thorough examination. The only hope of relief lay in early recognition, and prompt and thorough excision.

DR. E. J. A. ROGERS, of Denver, reported a series of Surgical Cases, including cases of curetting of the hip and ankle joints, and one of necrosis of the great trochanter in which the diseased bone was dug out, all followed by recovery. In a case of intestinal obstruction which had lasted for several days the condition was found to be due to internal strangulation through old adhesions. In a case of chronic dilatation of the stomach in which the Murphy button was used to establish an anastomosis between the stomach and jejunum, the patient died soon after from other causes. The union was found to be perfect, the button had fallen into the stomach. He reported five cases of acute appendicitis operated on, all recovered. In one, the length of the appendix was six and a half inches. He also reported two cases of nephrectomy, and one of partial operation on an extensive abdominal sarcoma greatly benefiting the patient.

"Resection of the Femur for Angular Deformity" was discussed by DR. GEO. W. MIEL, of Denver, who reported a case. The deformity was outward from exaggeration of the natural bend of the femur by the action of the strongly attached muscles. Even with a transverse fracture and no overlapping there was shortening of three inches. He practiced and advocated a Y-shaped incision, in preference to the V-shaped, as it caused practically no loss of natural tissue, and therefore less shortening.

DR. LEONARD FREEMAN, of Denver, reported a "Case of Spontaneous Dislocation of the Hip-joint in Connection with Typhoid Fever." The patient was a girl aged 10 years. The dislocation probably occurred about the fourth week, from arthritis and malposition in bed. About the sixth or seventh week some tenderness and deformity were noticed. At the tenth week, when seen, there was shortening of one and a half to two inches, the head of the bone was on the dorsum of the ilium, and there was atrophy of the muscles about the joint. Under a general anesthetic the dislocation was reduced at the second or third attempt. The parts were kept in position and passive motion not begun until four weeks. There remained a slight but diminishing shortening of the limb, probably from lack of growth during the period of dislocation.

DR. W. W. GRANT, of Denver, reported a series of "Cases of Appendicitis," that he had operated on with recovery. In the worst case, in which the general peritoneal cavity was involved, unfavorable symptoms developing including great distension, the colon was tapped; and this was followed by prompt improvement. He believed that when the appendix was not found in the abscess cavity, adhesions should not be broken up searching for it. The most dangerous cases were those in which the appendix hung in the peritoneal cavity. He did not think that every case must be operated on; but all severe cases might require it. Relapsing cases should be operated on in the interval.

(*To be continued.*)

American Electro-Therapeutic Association.

Fourth Annual Meeting held in New York Academy of Medicine New York, Sept. 25, 26, and 27, 1894.

WILLIAM J. HERDMAN, M.D., President.

(*Continued from page 980.*)

DR. MARGARET A. CLEAVES, of New York, read a paper on

SPECIAL HYDRO-ELECTRIC APPLICATIONS.

It seems strange that considering the time in which general hydro-electric applications have been used, advantage has not been taken of the opportunity offered by the accessible mucous cavities of the body for such applications. So far as I am aware, nothing has been done in this regard save by the Boudet de Paris method in the treatment of intestinal occlusion, and direct application of electricity to the stomach as developed by Dr. Max Einhorn of New York. Neither have come into the prominence which their merits deserve, but this is to be explained, no doubt, by the fact that these applications require a good deal of time on the part of the operator and patient, and in the case of applications to the stomach, upon the discomfort attending the introduction and presence of the stomach electrode.

Since establishing my methods of localized hydro-electric applications to the accessible mucous cavities of the body, I have found two references with which I was not familiar before. Dr. W. S. Hedley, of Brighton, England, in his book on "Hydro-Electric Applications," refers to the possibility of applying electric douches and calls attention to their value in the event of suitable means being devised for their use; he has not, however, resorted to these measures, although he has used electric douches for an ulcerating cancer, situated externally, with marked amelioration. Beard and Rockwell in a few paragraphs call attention to hydro-electric applications and say that in accessible places, as in various cavities of the body, ulcers, sores, etc., water used as an electrode is an excellent method for applying electricity, and they further state that ordinary douches can be used for the eye, ear, stomach, rectum, uterus, etc., so long as the current is not sent out in a spray, and recommend the use of Potter's apparatus for these purposes. This apparatus I am not familiar with.

A brief resumé[1] of the development of the Boudet de Paris method and its work in intestinal occlusion can not fail to be of interest here. In surgical operations for this condition the mortality is variously given from 58 to 64 per cent.

By the work of Duchenne de Boulogne in localized electrical applications, attention was first drawn to the advantages of electricity in the treatment of obstinate constipation and intestinal obstructions. He used the induced currents almost entirely for his physiologic and pathologic studies, and others have followed in his footsteps. In 1876, however, Leroy d'Etoilles observed that unstriped muscular tissue was not excited by the excitations of an induction coil, but on the contrary, such excitations were the most powerful in causing contraction of striped muscle. Later, in 1882, Boudet de Paris insisted on this distinction and proved that only slow excitations of continuous currents could have any direct influence on intestinal contraction, and that, therefore, the constant current should be preferred to the induced current in the treatment of occlusions. But at the same time of the experiments of Boudet de Paris, the induced and constant currents were indiscriminately used in the treatment of intestinal occlusion and constipation. It has been shown, however, by many experimenters that smooth muscular fiber is excited with difficulty by induced currents. The reason is a physical one, and is explained by the fact that the induced current proceeds by shocks of very short duration, sufficient to move the striated muscle which contracts quickly, but insufficient to put in action the unstriated fiber in which the contractions are characterized by a tracing of the form of a prolonged undulation. One has but to recall the character of the graphic curve of an induced current to appreciate this fact. Experiments upon the intestinal tracts of healthy animals show that at the end of a few seconds there is an increase in the peristaltic movements, but diminishing the excitability of the intestine artificially by distension with air, the induced current within the limit of medicinal doses is found inactive. On the contrary, the continuous current under these conditions shows itself capable of causing intestinal contraction and if in place of a continuous flow in one direction, there are reversals, it is easily proved that the intestine contracts no less readily than if it were not distended. Theoretically, as in the case of intestinal occlusion, there is always more or less of paresis due to the conditions of the disease; the action of the continuous current is therefore preferable, but until the establishment of the Boudet de Paris method, there was no way by which this current could be used internally without producing a galvano-caustic action at site of the internal electrode. Such an action as this is most undesirable, and by extension of inflammation the danger of producing a stricture of the bowels is by no means small. But very small current strength could be used, and even then there remained the danger of destructive polar action. The question, however, of treating these intestinal conditions has been settled most satisfactorily by the hydro-electric

[1] Revue d'Electrotherapie, October and November, 1892, Dr. Larat.

method of Boudet. He uses an electrode made of rubber provided with a hollow metallic tube with a nozzle for the attachment of a fountain syringe and an attachment for the tip of the conducting cord as well. The sound is provided with an eye upon the side and about 2 centimeters from the end, or an opening situated quite at its extremity. In the latter instance, the metallic tube stops about 2 centimeters from the end of the sound.

Technique.—First the fountain syringe or irrigator should be filled with the lukewarm saturated solution of rock salt. An Apostoli pad is placed upon the abdomen and attached to the positive pole while the active electrode is introduced into the rectum as deeply as possible, in order that the mass of water constituting the injection shall pass well into the intestine, where the reflexes controlling defecation are not active. Connection is then made with the hose of the irrigator and with the negative terminal of the battery. The stop-cock governing the flow of the water is opened and half the contents of the irrigator are allowed to flow slowly in, and as the salt water flows into the intestine it becomes the electrode, carrying the current to every part of the mucous membrane with which it comes in contact. This extensive water electrode, affording as it does a large square inch area of surface, makes it possible to secure by the use of low E. M. F., a larger current strength and therefore great electrical energy without pain or discomfort. In case of pseudo strangulation and obstruction due to fecal matter, the continuous flow is sufficient, but where there is an obstacle to overcome, stronger excitations by reversing the current after the first five or six minutes are necessary. The needle should be carried back to zero, poles reversed and current turned on to former strength. This will almost always produce an intestinal contraction, accompanied by a desire to defecate. This should be resisted by the patient as much as possible until the séance is completed, but if it can not be overcome, the treatment should be suspended and the patient urged to use all the possible effort to expel the contents of the bowels. One of the three things follows: either there is an abundant evacuation, feces are expelled mixed with gas, or the water passes only slightly colored, with or without gas. In the last two instances it is necessary to repeat the electrical enema in from seven to eight hours. If indicated, at least three applications can be made in the twenty-four hours. Larat reports 70 per cent. of successful cases out of 150 in the hands of Boudet de Paris. His own results are not quite so good, viz., 101 successful cases out of 230, but still make a satisfactory showing. He remarks that his cases were all seen by his colleagues of whom at least half were doctors in the hospitals, who called him in to assist their patients. This statement is made to show that his statistics have been well tried. As to contra-indications, all insurmountable mechanical obstacles, either outside of the intestine or down within its cavity must be treated with the knife. The indications[2] for the use of electricity are where "the obstacle can be overcome by a very strong contraction of the intestine, as in cases of 'stercorate' obstruction, intestinal palsy, 'enteraptose," stricture from a tumor, if the astriction is not absolute, or foreign body in the intestinal cavity." It is his custom in a case of intestinal occlusion where a purgative has been tried without any result, not to insist upon its further use, but immediately to give an electric injection. In twenty-four hours, he says, this will be recognized as successful or the contrary. In the case of a failure a surgical operation should be suggested. In this way much valuable time would be saved; surgical measures would oftener be of avail while many cases would recover by the intervention of the electric douche, who would otherwise be condemned to the shock of an operation. It was supposed that peritonitis would be found to be a contra-indication to the electric douche. Larat details several cases which demonstrate very conclusively that such is not the case but where its use tended to cut short the progress of the discase.

While Larat reports a few cases in which there have been unfortunate results, his reports would seem to indicate that they were due to the disease rather than, as was suggested, to the use of the electric douche. The slowness with which the liquid of the irrigator is introduced into the intestine, would naturally seem to do away with the fear of a break in the diseased intestinal tissue with the passage of the liquid in the intestinal cavity. One would expect this accident to happen more often with the forced injections of seltzer water.

This method, however, is not only of great value in the treatment of intestinal occlusion, but in constipation and in many of the diseased conditions of the gastro-intestinal tract as well.

For constipation the technique is the same. It is my custom to use from a quart to three quarts of lukewarm salt water according to the patient's toleration. I do not always carry the solution to the point of saturation. The negative pole is used for the active or intestinal electrode in order that its well-known stimulating properties due to the presence of the bases and hydrogen may be utilized. The C. S. varies from 5 to 10, 20 milliampères or more and reversals are made once, twice or several times, according to the needs of the case. As physiologic experiments go to prove that the stimulation of nutrition proceeds from the administration of mild currents, the higher currents are not deemed advisable. In ordinary cases, the continuous flow is sufficient, but where the response to the stimulus is not prompt, reversals are made. Sometimes I use the automatic interrupter of the continuous current, but I prefer a subsequent application of an alternating current.

Individual cases govern the amount of water used, C. S., duration of séance and frequency of application.

The applications are usually given for three successive days, when if the result is entirely satisfactory, *i.e.*, complete emptying of the bowels of fecal matter and gas, with a tendency to a return of normal peristalsis, they are discontinued and the subsequent treatment carried out by means of the Franklinic current with long percussive sparks to the lumbar and sacral plexuses, hepatic area and abdominal walls three times a week, and continued until there is complete elimination of toxins, improved metabolism, nutritional gain and normal functional activity. This is aided or not by medication, according to the case—oftener not. Cathartics are almost never given. Every hygienic and dietetic detail is considered, as well as habits and dress.

Rectal Electrode. Vaginal Electrode

I present here a rectal electrode which was made for me at my request (with the other electrodes for the various hydro electric applications) by the Galvano-Faradic Manufacturing Company, of New York City. All of these electrodes have been constructed with platinum wire for the conducting medium, extending from the point at which the water enters the electrode to within a quarter, to a half inch, of the end of the perforated rubber tip. By the use of platinum it becomes possible at once to use not only negative but positive currents and any drug cataphorically that one may desire. At first carbon tubes were used, but as it

[2] Larat Revue d' Electrotheraple, October, 1892.

was found that platinum wire could be substituted without increasing the expense, this was done.

The long and curved rectal electrode is intended to pass as far as the sigmoid flexure. By its use the water can be diffused more thoroughly into the intestinal tract and consequently the current carried farther, or in the event of disease at the sigmoid flexure, a localized action may be obtained at that point either by means of the constant current douche, negative, or by cataphoric medication, utilizing any drug that may be indicated.

In the treatment of constipation by electricity there is a beneficent action upon the circulation, respiration and general nutrition. As a result of its action there is a modification of the abdominal circulation, and certain conditions of passive congestion disappear, especially as found in cases of abdominal plethora. Under its influence both the volume and the force of the muscles are increased. The atonic intestinal muscles again become capable of action, while the strength of the accessory muscles, as those of the abdominal wall, is increased.

The evil results which follow chronic constipation are legion, and every method other than drug-taking deserves careful investigation and experimentation at our hands. To establish a rational therapy, great care must be taken in discovering the cause of the condition.

Atony[3] of the intestine is considered one of the most frequent causes of constipation, and may be described as a condition in which the walls of the colon have lost their tonicity and therefore are unable to expel feces at the normal rate. In all cases dependent upon atony of the muscles of the intestine or abdominal walls, the best measures are electricity, exercise, massage and hydro-therapy.

In many of the diseased conditions of the gastro-intestinal tract hydro-electric applications stand us in good stead. For instance, in intestinal catarrh, enteritis, simple, pseudo-membranous or follicular, in chronic thickening of the mucous membrane, and in chronic diarrhea due to fermentative and putrefactive conditions. The stimulating effect of the electric current on the nervous system, and secondarily upon the muscular and glandular tissues thus localized tends to restore healthful function. The nutrition of the part is promoted by the physical properties of the current, electrolytic and cataphoric. These are conditions in which drugs fail, if depended upon alone, and which must, to a very great extent, be combated by local measures.

One of the very intractable intestinal conditions, with which we meet, namely that of pseudo-membranous enteritis, is estimated by Prof. Germain See[4] to be found in about one-third of the patients, principally women, who are treated for gastric derangement. The pain and swelling over the colon, and gaseous fermentations are symptomatic of the condition, but the distinguishing feature of the disease is the presence in the stools of mucus, glairy and cylindrical masses. In the treatment of pseudo-membranous enteritis, I have found applications of negative currents by means of the Boudet de Paris method exceedingly valuable. Within the past two years I have treated several such cases characterized by the usual muco-membranous discharges. All had run a persistently chronic course, were characterized by irregular exacerbations, lack of marked febrile excitement, persistent derangement of the intestinal canal, mental depression and general impairment of health; also by more or less gastric disturbance, impaired appetite, repugnance to food, furred tongue, and foul breath. They were all of some years' standing, and had resisted the remedial agents administered from time to time when under the care of different physicians. At this time, however, these patients have good and normal appetites. The gastric and intestinal distress has disappeared, the bowels are regular, and the general health markedly improved and none of them have membranous casts any longer in the discharges.

After the first applications there was noted a change in the appearance of the tongue, which in the interval of the first and second treatments lost its coating and the red and irritable condition at the sides and tip. From six to eight negative applications were made in these cases with a C. S. of from 10 to 30 milliampères, the quantity of the douche varying according to the patient's toleration from one pint to three quarts. The time of the continuance of the current averaged ten minutes at each treatment. An ordinary Apostoli pad was placed over the abdomen.

In the so-called recurrent attacks of peritonitis in gouty subjects, which are really gout of the intestine and in those cases of gastro-enteric rheumatism affecting the nerves of the alimentary tract and simulating in some cases, by the character of the pain, trouble with the pelvic organs, I have found negative hydro-electric applications of the intestinal tract of undoubted curative value. A patient under care this past winter, a gouty subject, came to me with a history of prolonged pelvic trouble (seven years, and for which she had been three months in a hospital, curetted, douched, etc., and subsequently treated by means of intra-uterine applications *a la* Apostoli) continued to have recurrent attacks of severe pain that diminished gradually, neuralgic in character, associated with bloating, tenderness, slight feverishness, great anxiety, loss of appetite and mental depression. The cycle of pain and disturbance would complete itself in from two to four weeks to be followed at intervals by another and yet another. Here intra-uterine treatment accomplished but little, in fact, I may say nothing at all, save to relieve slight sensitiveness of the endometrium, but intra-rectal negative hydro-electric douches relieved all symptoms, improved the constipation, and established the general health. In this case I shall expect a return of the symptoms when the conditions are favorable for an attack of gout, as the patient does not live in such a way, so far as diet and exercise are concerned, to lessen the chances of its recurrence.

Haig considers that many cases of colic, enteralgia, enteritis and typhlitis are really gouty manifestations located in the intestine. From my experience, the constant current used externally in chronic peritonitis, I should expect to get much better results from hydro-electric applications.

In addition to the thorough system of intestinal irrigation already practiced in cholera, positive electrolysis of suitable fluids within the intestinal tract, or diffusion of appropriate drugs into the submucous structure by means of the electric douche might prove a valuable aid.

After the electric injection, patients have sometimes complained of a burning sensation and smarting in the anus. This is not caused by the electricity, unless perchance there should be some oozing of the water between the sides of the electrode and the anal walls. It has often seemed in some cases to be due to the intense saltness of the water. Larat has suggested where this is much complained of that Vichy might be used instead.

In using this method in the treatment of chronic constipation, I found that patients who were suffering as well from exudative material in the pelvic cavity noted an amelioration of the symptoms arising from that condition, which upon physical examination I was able to corroborate. This led me to utilize it in the treatment of pelvic exudates and also to a certain extent in other pelvic conditions, such as ovaritis, relaxed conditions of the uterus, etc. I was very glad, indeed, to avail myself of its use, as for a long time I had been extremely averse to the application of the constant current by means of the vaginal electrodes in common use. Even in the hands of the expert, I found great danger in the use of the most carefully constructed vaginal electrode of producing at point of contact, galvano-caustic action, and in the hands of those less expert I have seen very bad eschara resulting in gangrenous sloughs followed by slight hemorrhage. I was convinced that the method was intrinsically faulty and that some other way must be resorted to, to bring the tissue of the pelvic organs under the influence of the current, and thus my observations with the electric enema led to the construction of an electrode for the purposes of vaginal electric douches. In exudative inflammations of the pelvis, as well as in the diseases of the vulva and vagina, the principal aim of the gynecologist is to obtain the resolution effects of the current, and by use of the water electrode it is no longer the apparatus, but all the tissues with which it comes in contact, which becomes the electrode and the active pole of the circuit. With the large surface thus brought under its immediate action, one obtains a great enough force of the current to influence the entire pelvic tissues.

In these administrations with an observed E. M. F. of 90 volts, an observed current of 40 milliampères and an observed time of 600 seconds, there was obtained by calculation a resistance of 2,250 ohms; the power (*i.e.*, the rate of expending energy) 3.6 volt-ampères or watts; and the total energy expended, 2,160 volt-ampère-seconds or joules) resulting in severe contractions in the muscular fiber of the uterus which patients have likened to labor pains. That the current density was not under these circumstances sufficient through any given tissue to produce a galvano-caustic action, is the best evidence of the great utility of the method of application.

The electrode which I show here has already been described.[5] I now use platinum wire, however, instead of a

[3] Henoch, Medical News, August 11, 1894.
[4] London Lancet, Jan. 6, 1894, p. 65.

carbon tube, for the conducting medium. It will readily be seen that there is no point of contact of the conducting material of the electrode with the mucous membrane in either rectal or vaginal applications. The salt water or the medicated solution, whatever its nature, is the electrode. Since the description of this electrode I have substituted a douche pan for the drainage hose. This obviates all danger of wetting the patient's clothing in any given application.

Thus far I have used the vaginal hydro-electric applications in vulvitis, pruritis vulvæ, simple and diabetic, eczema of the vulva, chronic vaginitis, gonorrheal vaginitis, erosions of the cervix, relaxed and congested condition of the uterus and vaginal walls, in leucorrheas dependent upon the same, and in displacements associated with these conditions, in pelvic exudates, ovaritis, and supplementary to intra-uterine applications in fibroids, endometritis and salpingitis.

In gonorrheal vaginitis—a condition which is recognized as extremely difficult to treat—it will be possible by this method to bring not only the os and the cervic uteri, but every interstice of the vagina as well, under the influence of medicated solutions and thus combat the specific condition. The fact that the gonococcus penetrates the submucous structure, makes it very desirable that we should be able to apply our remedies in such a manner as to insure their destruction. By cataphoric medication this is possible, as the medicament not only comes in contact with the mucous membrane, but is caused to penetrate more or less deeply into its structure according to the law of cataphoretic transfer.

In the conditions indicating the use of an alternating current either alone, or as supplementary to an application of the constant current, I frequently apply it by means of the water electrode, with the result of a much more sensible diffusion of the current being felt throughout the pelvic basin by the patient than is experienced from the ordinary mono-polar or bi-polar applications.

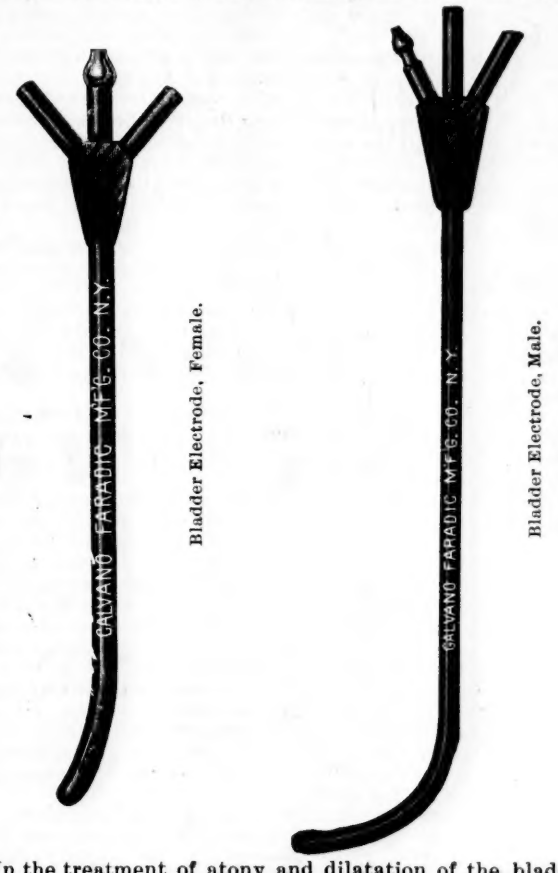
In a case of chronic vaginitis and eczema of the vulva, of twenty years' standing, with the most intolerable itching, for which the patient had resorted to various means for relief and obtained none, I have found this electrode of the greatest value. In this case the entire mucous membrane of the inner aspect of the labia was thickened, leathery and fissured. At the ostium urethrale and vaginæ the color was an intense crimson. The same condition extended into the vagina. There was extreme sensitiveness upon digital examination, and the patient was worn and harassed by the continued irritation from which she had not been free in all these years, despite the heroic measures that had been used to insure recovery. After one application of the negative galvanic current in the form of a douche, there was marked relief from the constant irritation and a tendency to heal on the part of the fissures. After four applications had been given, extending over a period of two weeks, the mucous membrane was found to be as sound and whole as that of a child, and the congestion at the mouth of the vagina and urethra had entirely disappeared, the mucous membrane having returned to its normal color and condition. There was complete cessation of the itching which had made the patient's life wellnigh intolerable, and a most marked improvement manifest in her general appearance. She remains under observation.

In making the application, the tendency is for the water to flow out against the shield, and in that way to come in contact with every part of the mucous membrane of the vulva. Patients find this method of applying the current exceedingly tolerable, and in the conditions for which I have used it thus far there has been an invariable expression of relief following its use. In conditions demanding it, the vaginal douche is supplemented by a douche to the external genitals as in eczema, etc.

Since I entered upon an investigation of these methods, I have had the opportunity of treating several cases of bladder trouble and of gonorrheal infection. The method should be particularly valuable in cystitis, acute, but especially chronic, in gonorrheal infections of the cyst, in atony and dilatation; in fact, in any condition where the known properties of either continuous or alternating currents would be of value. The applications which I have thus far made have, with low current strength, 5 to 20 milliampères, been without pain or even irritation.

The electrode for these applications is, like the others, constructed of hard rubber and is similar to the ordinary two way catheter used for vesical irrigation, with a third branch for the battery attachment.

The nature of gonorrhea emphasizes the necessity of resorting to every method which offers a chance for the destruction of the gonococci, ere the opportunity is afforded them of migration and infection of other mucous and serous cavities. The difficulty in the way of doing this is fully recognized. It seems to me that in cataphoresis we have a measure which, from its physical nature, is destined to be of great influence in combating the primary disease. As in four-fifths of the cases the urethra is recognized as the seat of the disease, it is found necessary to direct therapeutic measures to that anatomical site. As it is a fact that the gonococci do not thrive in the bladder, the use of hydro-electric applications as directed to that organ and the vagina can not be depended upon alone to accomplish their destruction. Here, in addition to the use of cupric electrolysis to the urethral canal, the cataphoric douche applied directly to the ostium urethrale itself can not fail to prove helpful. In negative hydro-electric applications with a saline solution, every indication for the washing out of vagina, bladder, and all infected tissues with an alkalin solution is abundantly met, and then by the cataphoric douche the medicament, whether copper sulphate, bichlorid of mercury, zinc sulphate, etc., can be driven directly into the submucous structure of the tissues about the urethra.



Bladder Electrode, Female. Bladder Electrode, Male.

In the treatment of atony and dilatation of the bladder the continuous current affords the best results, because structurally we have to deal as in the case of the uterus or intestines with unstriped muscular fiber. The action of the negative electric douche as it impinges on the mucous membrane is necessarily stimulating, inducing muscular contraction, as well as, by its action upon the blood supply, improving the nutrition of the part. The method is unquestionably applicable in every diseased condition of the bladder where electricity is indicated, unless it be a localized lesion, where the galvano-caustic action of the current is desired.

A limited experience with hydro-electric applications to the nose and ear suggests that they may have their value, at least in the conditions where an ordinary douche would be indicated. In diseased conditions of the nasal passages and accessory sinuses, it is rational to expect that we will get the best result wherever there is an atrophic change. Let us glance for a moment, however, at the inflammatory conditions which precede these atrophic changes.[6] Here we

[5] New York Medical Record, August 25, 1894.

[6] I. Braden Kyle. The Etiology, Pathology and Treatment of Ozena, Medical News, May 5, 1894.

have engorged vessels causing intra-vascular pressure, followed by exudation which relieves the intra-vascular pressure, but which in turn brings about extra-vascular pressure or interstitial infiltration. As a result of the organization of the exudative matter, there will be interstitial thickening followed by contraction, and in either case nutrition will be interfered with, causing a certain amount of atrophy with consequent degeneration and alteration dependent upon the extent of nutritive change. In these conditions I should expect by the judicious use of a cataphoric electric douche, simple or medicated, according to indications, to so relieve such an inflammatory condition as to prevent the subsequent exudation. I have had no opportunity of trying it in these acute conditions, but throw out the suggestion. If the passive congestion of the mucosa, which has a tendency when once established to remain, can by this means be overcome, the atrophies and degenerations will be much less liable to occur. The presence of muscular fiber has been demonstrated in the Schneiderian membrane by Herzfeld of Berlin, and corroborated by Kolliker and Zuckerkandl. This fact would indicate the value in all these conditions of an alternating current douche as well, for wherever there is muscular fiber there will be muscular contraction in response to electrical stimulus, with the result of inviting fresh arterial blood to the part, thereby relieving congestion and stimulating the absorbents into healthful activity. The first indication to be met, viz., that of cleansing the mucous membrane with some alkalin solution, can not be more effectually done than by a negative constant current douche (saline solution) where, by the electrolytic action of the current, there is invited to the part the hydrogen and alkalies. With the electric douche there is to be obtained at the same time the physiologic effect of the current stimulating the parts to a healthy nutrition.

In the atrophies and degenerations where a maximum stimulating effect is desired, a cataphoric douche may be administered. Any drug (soluble in water) indicated in these conditions could be used whose electric diffusion is established. The clinical value of cupric electrolysis (with a copper electrode) suggests a solution of $CU_2\ SO_4$ used as a cataphoric douche. I have used this to advantage in atrophic rhinitis.

The value of copious, hot saline douches in the treatment of inflammations of the ethmoidal sinuses suggests the thought that in electric douches, simple or medicated, we may have an agent of still greater value.

In post-nasal applications the stimulating and consequently curative effect of the electric douche would be greater than that of the ordinary washing out or topical administration of medicated solutions, or here again, a cataphoric douche would not only free the passages from accumulated secretions but drive, at the same time, whatever medicament is used into the submucous structures where it would have an opportunity for beneficent action.

In congested and relaxed conditions of the pharyngeal mucous membrane I use the post-nasal electrode attached to the ordinary irrigating bottle or fountain syringe. Here the douche can only be applied momentarily. Even so, the diseased tissue may be brought much more promptly under the influence of drugs by cataphoresis than by means of the ordinary medicated spray.

In the treatment of thickening of the drum, where it is desirable to bring the membrane under the influence of the negative pole, the water electrode is particularly adapted. One can use requisite current strength without any danger of galvano-caustic action, and whenever it is desired to bring the ear directly under the influence of alternating currents, we have here an extremely painless method of so doing. The indifferent electrode in the treatment of thickening of the drum can be placed at the mouth of the Eustachian tube, thus bringing the diseased tube and drum at the same time within the interpolar influence of the current. In such cases I have used the ordinary copper electrode—nasal—attached to the positive pole at the mouth of the Eustachian tube, and the negative water electrode to the ear. Here, by the electrolytic action at the positive pole, there is obtained an oxychlorid of copper which by the cataphoric property of the current is pushed or conveyed along the course of the tube, while at the same time there is a movement of the hydrogen and salts set free by the electrolytic action, toward and to the thickened membrane, where they act to improve the nutrition of the part. There is also obtained, as well, the characteristic influence of the current upon the circulation, inducing first an anemia followed by a hyperemia and ultimately an equalization of the circulation. As a result of such applications patients have remarked that there was a *smoother feeling* in the ear and a feeling of *life and warmth* not experienced before.

The electrode which I use for these applications to the ear and anterior nares is made of hard rubber and similar in shape to the usual ear nozzle of a fountain syringe. The shorter arm is for the attachment of the hose of the fountain syringe, while the longer one is for the battery attachment. The conducting medium as I have already indicated is a platinum wire carried to about one-third of an inch from the distal end of the electrode, while a number of small apertures cause the water to flow out in the form of a rose.

(To be continued.)

Heilserum in Diphtheria.—Professor Bokai gives the following opinion before the Royal Society of Physicians in Buda-Pesth as the result obtained from 120 cases of diphtheria treated in the Stephanie Hospital, Buda-Pesth, Sept. 10 to Dec. 31, 1894. All cases were examined bacteriologically and Löffler's bacillus was found in all but five: 1, serum from a reputable source has a specific and beneficial effect; 2, the serum is superior to all other means of combating the disease, and no untoward effects have been observed, except urticaria in 10 per cent. of cases; 3, in severe laryngeal stenosis threatening death by suffocation, an operation, (intubation, tracheotomy) is a necessary addition to the serum-therapy; 4, in those cases in which the disease assumes a distinctly septic character from the beginning, the value of the serum is doubtful. Heart weakness due to organic changes and leading to paralysis, the serum can not relieve; 5, the question of prophylactic injections, from his lack of experience, is not decided for him, but from his results he believes that protective inoculations will be no less approved than the curative. The statistics of this hospital show that in 1891, of 135 cases of diphtheria 40 per cent. recovered; in 1892, of 92 cases 46½ per cent. recovered; in 1893, 32½ per cent., while in 1894, of 120 cases 74½ per cent. recovered. In the discussion following, Gerloczy referred to his use of serum in fifty-five cases and maintained that the serum offered no sure relief, yet he believed that by its general use the mortality is lessened about 10 per cent. and since he had observed no ill effects he regarded it as his duty to use the serum.—*Wiener klinische Rundschau*, May 5, 1895.

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SATURDAY, JULY 6, 1895.

THE PRACTICE OF MEDICINE IN CITIES.

The rush of young men, not well prepared, into the practice of medicine is likely to be checked and headed off for a time. The State examinations for license to practice will raise the standard and drive out the incompetents and quacks. In some of the large eastern cities new questions of professional peril are coming into prominence. Teachers and specialists in every city have depended very largely on consultation practice. The strain to secure a position in a medical college was, in most instances, to enlarge their acquaintance and consultation practice. This has grown to such an extent that vacancies for teaching are bought and sold, not always for so much money, but for influence and prospective power to help the college and its teachers.

The time came when the would-be medical teachers far exceeded the demand, and the polyclinics were organized. This appeared to be a most fortunate opening for many, and the rush for places and professorships was the same as in the colleges. Free services were offered, and large assessments were made to cover expenses and buildings, all freely paid. The inland practitioner who came to improve and enlarge his knowledge was cultivated as one who would yield large returns in future consultations. Elaborate and exhaustive studies in clinical surgery and medicine, by large, eminent faculties, are served up with earnest skill. Classes of very enthusiastic physicians go away with hearty praise to the faculty and thankfulness. These physicians return to work with not only greater skill and practical knowledge, but a degree of confidence to do all their own surgery, and be their own consultants. They recognize the practical significance of saving the large consultant fees, and doing the work and keeping the case in their own hands. They open hospital rooms and gather round them appliances and nurses for doing the work that large hospitals have concentrated in the cities. Nearly all the large operations in surgery, occurring in persons who are able to pay, are retained and treated by the polyclinic students and graduates. Hundreds of cases from the villages and towns, that were formerly sent to the large cities, are now treated at home.

Physicians who wish to become expert in some line of surgery, take special courses at these schools and then return and treat all these different cases, while the poor, hard-worked professor finds his dream of increasing consultation vanishing into thin air.

The only class of cases that come in from the country are indigents, and the professor's skill and technical knowledge is assumed by graduates in every town of the land. The poor professor is teaching and paying assessments to keep up the school and educating a class of stirring practical men to do the very work he depends on for a living. This is theoretically most commendable, but, practically, to poor men in large cities it is destructive. All medical teachers in eastern medical centers, who have not an income outside of their medical work, suffer and find the strain of practice growing greater every year. A reversion is going on. The country and village practitioner, who attends the polyclinic every year or more, and becomes familiar with the best methods of practice, is the peer of the city professor. He can command and control his cases and collect his fees while living in most comfortable, easy surroundings. His brother in the city must keep up a style of wealth and prosperity, even although grim want may hang round the kitchen door. If he is a teacher his time and money must be spent freely, although nothing tangible come back. His love of science and willingness for sacrifice must rise above every other consideration.

The polyclinics, while increasing the labors and strain of practice in large cities, are great blessings to the profession, especially to the army of isolated inland physicians, who are anxious to keep well up to the frontiers of science.

They are equally valuable to those who realize their failures in early studies and preparation for work. The present popularity of these schools will decline as better educated men come into the ranks of the profession. In the meantime the frantic efforts to attract patients to the cities by free dispensaries and hospitals, where the foolish teachers give away their time and services for nothing must die away.

At present, the hospital dispensary and much of the private practice of medicine in large cities is conducted on the most idiotic and childish principles.

Some surgeon will charge $500 for an operation which he may have done a dozen times in the hospital within a month free, on persons able to pay.

Bids are made for cases to come to large hospitals where the operations are free, only some nominal price of board is charged. This has become an abuse which has produced much bitterness in many circles. Free medical services, and a craze to teach medicine for nothing, and the increasing strain to secure patients to illustrate the service, and to furnish an income to subsist on, are grave perils to physicians in large cities. It is a question which is the greater abuse, letting in an array of half-trained men to practice or to sacrifice the members who are in, by demands for free services and free labor, and placing them in positions which require the greatest skill and struggle to even make a living.

Now that the first abuse is to be corrected, is it not wise to agitate the next question, How is the practice in large cities to be regulated so that medical men can receive a rational and substantial recognition for their services? How is this foolish competition to become teachers, both cheapening the dignity and quality of the work, to be abandoned? Evidently some radical reforms are necessary, and this subject needs agitation.

THE ANTI-STREPTOCOCCIC SERUM.

Among the more recent applications of serotherapy is that of treating infections of the streptococci with the serum of animals immunized against the microbe which—as comprehensively summarized by a French contemporary[1]—causes phlegmon, erysipelas and puerperal fever; which induces suppuration in cellular tissue, as in serous cavities; which is always present in the mouth and pharynx; which may, in short, give rise to a series of affections ranging from simple angina to peritonitis and which, moreover, complicates nearly all infectious diseases, both acute and chronic. To successfully combat this terrible adversary would be to give aid of extraordinary power to the physician, the surgeon and the accoucheur. It is this aid which various observers, especially ROGER and CHARRIN, MARMOREK and CHANTEMESSE hope to have discovered in anti-streptococcic serum. MIRONOFF first and then CHARRIN and ROGER began by immunizing animals against the streptococci and, by injecting five or six cubic centimeters of serum from one of these immunized animals, prevented the development of the erysipelas microbe in the rabbit—one of the most susceptible animals. Recently the last two observers immunized a mule by injecting, in eight séances, 240 cc. of a toxin prepared by evaporating and sterilizing 2,400 cc. of a bouillon culture of streptococcus. With serum from this mule they cured in a few days two women suffering with grave puerperal infection, by injections amounting in one case to 50, and in the other to 96 cc. The daily dose varied from 8 to 25 grams, according to the gravity of the symptoms; recovery occurred in three to four days and complete convalescence in five to six days. In a weak new-born child, with erysipelas they succeeded in jugulating the affection with 5 cc. of the serum. Finally, in a pseudo-membranous angina, accompanied by serious depression with cardiac complications, temperature 106.2, pulse 148, a cure was obtained in three days by the daily injection of 30 cc. of serum.

At the same time MARMOREK, at the Pasteur Institute, succeeded in immunizing the horse, ass and sheep, either by injecting weak cultures and then more and more virulent, or by increasing doses of a toxin prepared by simply filtering cultures in bouillon through porcelain.

It is important to obtain as active a toxin as possible, and MARMOREK, by passing a series through rabbits, obtained a culture which killed them in thirty hours in the dose of one one-hundred thousandth of a centimeter. The animals were immunized with this very energetic toxin, though this required several months and several hundred rabbits to obtain the required potency.

Erysipelas was also treated by MARMOREK and CHANTEMESSE. Of eighty-six cases, forty appeared benign and were treated by ordinary methods; forty-six were grave and received serotherapy; all recovered save one old woman, who died of pneumonia ten hours after admission. They injected 5 to 20 cc. of the serum. The general condition was ameliorated; the temperature was lowered in a very short time, and where there was albumin in the urine this disappeared very rapidly under the treatment.

These authors claim that albuminuria accompanying erysipelas is cured by serotherapy. This claim is important, for some observers claim that the anti-diphtheritic serum has an injurious effect on the parenchymatous organs and especially on the kidneys. Some patients recovered in spite of an unfavorable prognosis given by the authors; none of the cases were followed by phlegmon or by abscess as is the rule in grave cases of erysipelas. According to the authors this result is due to the activity of the toxin employed to immunize the animals—the larger the dose of the active toxin the greater their degree of immunity. This immunization is a long and delicate process, for the animals react with extraordinary violence to even the smallest dose of the toxin. These results are encouraging but demand confirmation, for nothing is more variable than the gravity of erysipelas and the prognosis is always difficult.

As to the other varieties of streptococcus infection, the cases are too few to form any reliable opinion, though MARMOREK is still engaged in researches and promises some further observations shortly.

[1] Jour. des Sciences Med. de Lille. No. 17, 1895.

ANTIVENIN, THE LATEST CONTRIBUTION TO SERUM-THERAPY.

According to the *Press and Circular*, June 12, DR. THOMAS R. FRASER, professor of materia medica in the University of Edinburgh, has made a very significant announcement regarding his original work with serpent poisons. Early in the month of June DR. FRASER read a paper before the Royal Society, showing that animals may be immunized against the venom of the cobra as well as other serpents. He also showed that antidotal properties inhere in the blood serum of such immunized animals. DR. FRASER opened his paper with a historical account of the beliefs and traditions of the Hindoos and others, that poisonous serpents are self-immunized by some result of the absorption of their venom.

Since the year 1889, DR. FRASER has been in receipt, from different parts of the globe, of supplies of snake poison, especially of the Indian cobra, and with this had performed many experiments on animals in the hope of producing immunity. The results he obtained passed his most sanguine expectations.

Continuing its abstract of DR. FRASER'S paper, the *Press and Circular* says:

"Experimenting on rabbits, among other animals, he first satisfied himself as to the amount of the poison which constituted the minimum lethal dose. He then proceeded to inject quantities below this amount, and found that he could gradually increase them to *fifty* times the dose originally fatal. But not only that, for a buck rabbit, which he exhibited, and which was then in about the one hundred and fiftieth day of treatment, had gained enormously in weight, from 2,000 grams to 3,000 grams, and had increased greatly in strength, and especially in virile power. Again, he found that the mixture of 1-240 cc. of serum obtained from a rabbit immunized to thirty times the minimum lethal dose with cobra venom averted a fatal result on injection, while the injection of a similar serum half an hour after the injection of a venom which otherwise proved fatal in one hour, promptly stopped the symptoms which had already commenced, and saved the life of the animal. He called this protective serum by the name of 'Antivenin.' He also mentioned as an interesting fact that the rabbit above referred to had received during the months of treatment *enough cobra poison to kill two horses*, or about two hundred and eighty rabbits if unprotected. Not only are DR. FRASER'S results of the greatest value for the treatment of snake bite in India and other tropical countries, but, as he himself remarked, they possess a deeper significance in accentuating, as they do, the wonderful progress made in serum-therapy during the last few years, and are an earnest of still more wonderful discoveries yet to be made in the same direction. It appears also that immunizing an animal with the venom of one kind of serpent *protects it from the poison of other species*."

In conclusion, it may be said that DR. FRASER is well known for his original investigations concerning calabar bean and the other ordeal poisons of West Africa. We may confidently predict that his findings will be confirmed.

AN INTERNATIONAL CONVENTION OF BACTERIOLOGISTS.

The bacteriologists of the country held a convention, June 21 and 22, in the New York Academy of Medicine, under the presidency of DR. WILLIAM H. WELCH, of the Johns Hopkins University. On the first day of the conference, papers were read by DRS. FULLER, WELCH, SURGEON-GENERAL STERNBERG and DRS. SEDGWICK and CHEESMAN.

The most important work of the convention was the appointment of a committee to investigate the bacterial field as applied chiefly to the water supplies of cities, and to decide as to the standard types, methods of cultivation, and the interpretation of results.

The following delegates were appointed upon this committee: PROF. J. S. ADAMS of McGill University, Montreal, Chairman; PROF. W. F. SEDGWICK, Biologist of the Massachusetts State Board of Health; DR. G. W. FULLER, Biologist in charge of the Lawrence Experiment Station of the Massachusetts State Board of Health; DR. CHARLES SMART, U.S.A., Chairman of the Committee on Water Supply of the American Public Health Association; DR. T. M. CHEESMAN of the College of Physicians and Surgeons, THEOBALD SMITH of the Massachusetts State Board of Health, DR. A. C. ABBOTT of the University of Pennsylvania, and PROF. W. H. WELCH.

A LONDON "REFUSE DESTRUCTOR" PLANT ON A LARGE SCALE.

In one of the parochial districts of London, St. Pancras, the problem of disposing of municipal refuse at the lowest cost is being solved. And more than that, this refuse is made of practical value in connection with the parochial electric-lighting works. The city refuse, or "dust," to use the English word, is consumed in specially constructed furnaces, and the heat thus generated used to produce power to run the electric plant.

These new buildings cover an area of two acres and a half, facing King's Road, and the most noticeable feature of the plant is the huge chimney that rises to a height of 231 feet, and that cost over $15,000 to erect. The total cost of the plant has been $500,000.

The "dust" is collected throughout the district by carts and carried to a rear entrance, weighed and tipped into enormous tanks on each side of the main shed. To these tanks are attached hoppers, which convey the refuse to furnaces of new design, and considered to be of the best type now existing.

A novel feature of the whole scheme is its general automatic working, which requires the least possible outlay of manual labor. For instance, the furnace

is fitted with an ingenious appliance of alternating bars, moving up and down with an eccentric forward motion, carrying the refuse continually toward the center of the fire.

There are eighteen furnaces, capable of consuming 1,260 tons of dust per week. There is but a small amount of "clinker" left behind, and this is withdrawn every six hours. This can be used to form an exceptionally tenacious mortar, and its sale, (together with certain reduce expenses) will yield a probable gain to the parish of $25,000 per annum.

The fiery gases from the burning material pass through long flues to the engine room of the electric works, pass around and in front of the boilers into an "economizer," and so into the chimney. The destructors are said to produce 12,000 degrees of heat, and supply from 300 to 400 horse-power to the boilers. Efficiency with economy is proved possible in this scheme. For instance, the water needed is procured by saving the waste steam, passing it through a condenser and a water softening apparatus, pumping it to the top of the building to a cooler, whence it returns to a tank of 115,000 gallons capacity.

There will be a saving in cartage of refuse, a saving in coal at the electric station, and a saving to the taxpayers who will have cheaper and better street lighting, and a valuable asset.

The *Lloyd's Newspaper*, from which the above description is taken, remarks: "The possibilities of the use of city refuse as fuel may be followed by as interesting results as was the discovery of the value of the despised coal-tar, and also of refuse petroleum."

ASSOCIATION NEWS.

Section on Surgery and Anatomy.—*Minutes of Meeting of 1895.* The Section was called to order on Tuesday May 7, 1895, at 3 o'clock P.M. by the chairmen Dr. Jos. Ransohoff of Cincinnati, Ohio, who delivered his inaugural address, dwelling in it on the diagnosis and treatment of stone in the kidney and presenting four specimens of kidney stones which he had removed.

The following papers were then read: "Cystoscopy, Catheterization of the Ureters and Catheterization of the Kidneys in the Female," by Howard A. Kelly, Baltimore, Md.; "Aëro-Urethroscopy with the Exhibition of a new Instrument," by W. K. Otis, New York, N. Y.; "The Value of Urethroscopy in Chronic Urethritis with demonstration of the Nitze-Oberlaender, Casperand Posner Urethroscopes and other Urethral Instruments," by Ferd. C. Valentine, New York, N. Y., and were discussed by Drs. Otis of New York, Deaver of Pennsylvania, Valentine of New York.

Dr. Valentine also asked leave to present in behalf of Professor Posner of Berlin, Germany, a paper on "Cryptogenic Cystitis and Pyelitis" which was received and read by title.

A paper on "Movable Kidney" was then read by Homer Gage of Massachusetts, and discussed by Dr. Wyman, of Michigan; De Forrest Willard, of Pennsylvania; Weeks of Maine; Ferguson, New York; J. B. Roberts, of Pennsylvania; Fenger of Illinois and Davis of Alabama.

A paper on the same subject by Dr. E. B. Davis, of Barmingham, Ala., was read by title.

A paper on the "Radical Cure of Hydrocele" was read by D. C. Hawley, Vermont, and discussed by Drs. McLean, Michigan; Gaston,Georgia; Vance, Kentucky and Rodman of Kentucky.

A paper on "Erosion, Excision and Amputation in Joint Diseases" was read by De Forest Willard of Philadelphia, Pa. The chairman appointed as a nominating committee Drs. De Forest Willard, Pennsylvania, J. B. Murphy Illinois, Weeks of Maine. Adjourned.

The Section was called to order at 9 o'clock A.M. Wednesday, May 8, and a paper entitled "A Note on the Surgical Cure of Hernia" was read by W. B. De Garma, New York.

The subject of "Appendicitis" was then treated by John B. Deaver, Philadelphia, Pa., and discussed by Drs. Weeks, Maine; McMonigle, California; Wyman, Michigan; Quimby, New Jersey; Murphy, Illinois; Marcy, Massachusetts; Hawley, Vermont; Herrick, Ohio; Willard, Pennsylvania; Bishop, Pennsylvania, and closed by Dr. Deaver.

The Secretary then showed for Dr. J. C. Schepps of Brooklyn, N. Y., an improved elastic tourniquett.

"Thoracic Troubles from a Surgical Standpoint" was the title of a paper by J. McFadden Gaston, Georgia, which was discussed by Drs. Wenz, Pennsylvania; Willets, California; Risley, Pennsylvania, and the Section then adjourned until afternoon.

The Section was called to order at 3 o'clock P.M. Wednesday, May 8, and a paper on "The Treatment of Malignant Tumors by the Toxins of the Streptococcus of Erysipelas," read by Nicholas Senn, Chicago, Ill. Discussed by Drs. W. B. Coley, New York; Sayre New York; Rocky, Oregon; Wyeth, New York; Herrick, Ohio; and Kern, Pennsylvania.

The following papers were discussed together: "Tumors of the Mammary Gland," by W. L. Rodman, Louisville, Ky.; "Is Total Extirpation of the Rectum ever Justified" by J. M. Mathews, Louisville, Ky.; "Colotomy vs. Extirpation in Cases of Cancer of the Rectum," by L. H. Adler, Philadelphia, Pa. Discussed by Drs. Tiffany, Maryland; Keene, Pennsylvania; Fenger, Illinois; Jacobson; Rocky, Oregon: Marcy, Massachusetts; Davis, Missouri, and closed by the readers of the papers.

The Nominating Committee reported the names of Drs. C. A. Wheaton, St. Paul, Minn., for chairman, and Dr. W. L. Estes, South Bethlehem, Pa., for Secretary for the ensuing year. On motion, the secretary was directed to cast the vote of the Section for these gentlemen who were thereupon declared elected.

A paper on "Bronchiogenous Carcinoma," by Charles A. Powers, Denver, Colo., was then read by title.

The following papers were read: "An Original Osteoplastic Operation for the Removal of large Vascular Tumors Growing in the Vault of the Naso-Pharynx, Antrum of Highmore, Spheno-Maxillary, and Pterygo-Maxillary Fissures," by John A. Wyeth, New York, N. Y.; "Electrolysis in the Treatment of Sacculated Aneurysm, through Introduced Wire, with Report of a Successful Case," by D. D. Stewart, and J. J. Sallinger, Philadelphia, Pa.

The Section then adjourned until the following morning.

The Section was called to order at 9 o'clock A.M., Thursday, May 9, and a paper on "Some Points in Asepsis in Private Dwellings with the demonstration of some new Aseptic Appliances," was read by Carl Beck, of New York, N. Y., followed by papers on "Ileus," by J. B. Murphy, Chicago, Ill.; "Scientific Uses of the Surgical Flap," George Wiley Broome. St. Louis, Mo.; "The Surgical Technique of Aseptic Wounds," by Henry O. Marcy, Boston, Mass.; "Flat-Foot—Supramalleolar Osteotomy with Report of a Case, Photographs and Specimens of Feet of Man, Orang, Baboon, Chimpanzee and Gorilla," B. Merrill Ricketts, Cincinnati, Ohio.

The Section then adjourned until the afternoon.

The Section was called to order at 3 P.M., and the Secretary having been called away, Dr. J. C. Oliver, of Cincinnati, was elected Secretary *pro tem.*

Dr. Murphy's paper on "Ileus" was discussed and the following papers were read: "Gall Stones in the Common Duct and their Surgical Treatment, with remarks on the ball-valve action of floating Choledochus Stones," by Christian Fenger, Chicago, Ill.; "Skin grafting after the Method of Thiersch," by J. C. Oliver, Cincinnati, Ohio; "Exsection of the Knee-Joint, with Report of a Case of complete Dislocation of the Knee, of nine years standing, and with especial Reference to Methods of Fixation," by S. F. Forbes, Toledo, Ohio.

In connection with this paper, Dr. Marcy, of Boston, Mass., showed a case of hip-joint resection done by Dr. L. A. Sayre in 1876. The head and neck of the femur had necroses and the femur was sawed through just below the trochanter minor.

He had excellent motion in the joint and made the difference in the length of his legs, which amounted to six inches, hardly noticeable by means of an "extension shoe," which was laced to his foot, and which allowed the use of an ordinary pair of shoes, the patient walking with the toe pointed instead of at right angles to the leg.

Dr. Marcy also exhibited a series of double tubes made by George Tiemann & Co., of New York, after patterns devised by him many years since and for a long time now in general use. The larger ones are designed for the washing out of the stomach, rectal irrigation, etc. The smaller are catheters in various sizes, both male and female. The efferent tube is twice the size of the direct, in order to prevent over-distension. They are made in the same finish as the rubber catheters. The value of these soft rubber tubes for the purpose of irrigation has somewhat recently been emphasized at the Johns Hopkins Hospital, from which they have been offered to the profession as a recent invention of one of the members of the medical staff. It is on this account that they are presented to the Section.

The following papers were then read: "The New Surgical Splinting—Report of Cases Exemplifying it," by E. A. Tracy, Boston, Mass.; "A Simple Method of Dressing Fractures of the Extremities auxiliary to the Bandage," by John E Link, Terre Haute, Ind.

The Section then adjourned till Friday morning, when it reconvened at 9 A.M., and the following paper was read: "Deformities following Fractures of the Shafts of Bones," by Thomas H. Manley, New York, N. Y.

The Section then adjourned for the year.

REGINALD H. SAYRE, Secretary.

CORRESPONDENCE.

The Michigan Practice of Medicine Act.

CHARLOTTE, MICH., July 1, 1895.

To the Editor:—In the JOURNAL of June 15, in the editorial columns, I notice the report of the Michigan Medical Society for its recent meeting. I wish to call your attention to this paragraph which I herewith quote: "Michigan, still, by deliberate act of its Legislature, remains the dumping ground for the world's incompetent and dishonest doctors."

The Legislature of Michigan in its last session passed the bill to regulate the practice of medicine and to prevent that which you deplore, as well as all honest and intelligent people. It would have become a law, *but for the veto of the Governor*, who only exercised that prerogative after the Legislature had adjourned, and could not pass it over the veto for that reason.

Hoping you will correct the misstatement, and do justice to at least a portion of Michigan's unfortunates,

I remain yours, G. B. ALLEN, M.D.

Member of the Legislature and Representative 2d District, Eaton County.

ANSWER. "For of all sad words of tongue or pen
The saddest are these: 'It might have been.'"

PUBLIC HEALTH.

Yellow Fever.—Press dispatches announce the existence of yellow fever at Tampa, Fla., July 4.

Added Duties in the New York Board of Health.—The Health Board of New York City, along with the fire, excise and building departments, since the recent annexation of a territory covering about 20,000 acres of land, with a population of 17,000, must now extend its lines. This recent addition which more than doubles the city's territory north of the Harlem River, adds more than a third to New York's domain. Many a problem of drainage, grading and water supply remains to be solved, with the inevitable conflict between taxpayers and sanitarians.

A Navy-Yard Garbage Destructor.—At the Brooklyn navy yard, a small garbage destructor has been put into operation. The crematory is a structure about 25 x 30. The framework is steel, and the outer walls are made of corrugated iron. Within this is the oven or crematory proper. This latter is composed of brick, stone and iron. There are six doors or openings to the crematory. One of them is used for making the fire, another for removing the wood ashes, and the other four are the openings through which the cremated garbage is drawn. The garbage is introduced at the top of furnace, the garbage wagon taking its loads there by means of an inclined plane and platform. The fuel used is largely the waste wood which is collected from the work-shops of the yard. The capacity of this destructor is said to be ten tons daily.

"Malta Fever."—In a brief paper contributed to the London *Lancet*, W. Hill Climo, a retired brigade surgeon, points out that the history of the so-called "Malta fever" is strangely similar to what obtained a few years ago in reference to the increasing prevalence of, and mortality from enteric fever in India. From time to time various explanations were hazarded to account for the phenomena connected with it; but they had to be discarded, and now the disease is admitted to be in every respect identical with the typhoid fever of European countries, being specific in origin, and traceable to a sewage-polluted soil affecting the water supply. It is believed that in the near future a like view will be taken of Malta fever and its specific character recognized, the disease originating in local insanitary conditions and the action of climate in its production being chiefly manifested by its influence on these conditions, and not directly on the constitutions of individuals in the first instance. That such grave sanitary defects as Surgeon Climo describes should be allowed to exist unheeded in a military possession of the country which has done so much for military hygiene is quite as singular as the failure hitherto to recognize the specific filth character of the disease these defects have produced.

Death Rates in Foreign Cities.—The following statistics of foreign cities have been collected and collated, by the Paris *Herald*, for the year 1894: "Among the highest death rates are those of Moscow, 34.1 deaths per 1,000 of population; St. Petersburg, 31.4; Rouen, 31.3; Havre, 29.8; Naples, 27.7, and Milan, 25. Dublin had a mortality of 24.7 per 1,000; Munich, 23.7; Cologne, 23.1; Prague, 22.1, and Bordeaux, 21.3. Among the lowest death rates are those of London, Liege and Berlin, respectively 17.7, 17.6 and 17.2. Still lower are the figures for The Hague, 16.9; for Frankfurt, 16.5, and for Bristol, 15.4. In cities where the population fluctuates rapidly, these figures may be slightly too large or too small. But it is very noticeable that in some of the large towns and cities of Europe the actual death rate has been immensely reduced by modern sanitation. The mortality of London in 1870 was 24.3 per 1,0000, and in 1881, 21.6. The death rate in Paris in 1881 was 25.5, but it is now only 20.2. As late as 1873 Berlin's death rate was 28, and in 1878 Professor Virchow showed it was increasing. It is, therefore, apparently a great triumph of sanitary science that in 1894 it should be so low."

Infectious Disease Hospital on Wheels.—In a rural section of Scotland there is in use an ambulatory hospital for infectious cases, that has been devised with no small degree of care. The following is a portion of a description thereof in the *Medical Press and Circular*, May 22: "The county authorities of the eastern part of East Lothian have determined to provide their district with three hospital caravans for the purpose of treating infectious disease. The first one was inspected the other day in Leith and gave great satisfaction. The caravan, which will be drawn by two horses, measures, internally, 19 x 10 x 8, giving an air space of 1,520 cubic feet. It contains two beds, curtained off. It has a double lining of wood and an end is made so that the panelling can be removed and the caravan placed against another caravan in corridor fashion. It is well ventilated by means of Tobin's tubes and has another ventilator on the roof. The total cost of

each will be £100. The advantage of such a movable hospital in a rural district is manifest, and even if there is a considerable epidemic in one part, several caravans can be collected together there. The difficulty, we should suppose will be, in such districts, to procure proper accommodation for the nurse required, and also about the efficient and sanitary disposal of excreta and infected clothing. The caravan itself is so made that it can be thoroughly disinfected when necessary."

Double Role of the Staphylococcus Albus.—The white staphylococcus, *S. pyogenes albus*, found in pus and hitherto associated, as the name implies, with pus formation, has been found according to M. Charrin, in considerable numbers in the breast milk of women apparently in the rudest health and whose nurslings thrive on their milk. This discovery, which was proclaimed at a recent meeting of the Biological Society of Paris, would seem, according to Dr. Dolan,[1] to strike a severe blow against the modern germ theory of disease. In which connection Dr. Dolan cites the observation of a writer in *L' Union Medicale*, who says that in reality, as regards the breast as well as the bronchi, intestines, etc., if the pathogenic agent frequently makes its entry from without, it also at times preëxists within the system, awaiting some occasional cause such as traumatism, a febrile affection, or other exciting agent in order to make its presence manifest by swarming, Dr. Dolan asks: "What is the nature of this occasional cause? Calling it traumatism, etc., does not help toward the elucidation of the knotty point. The staphylococci at one moment are beneficial and wholesome toward their human host; at another they become virulently noxious. What is the real cause of this change of front? It is not too much to say that we know nothing whatever about it."

To Reduce Infant Mortality.—"The Sterilized Milk Charity" in New York City will be continued during the summer of 1895. The fourth of the sterilized milk booths for which Mr. Nathan Straus has the permission of the Park Department to erect, is to be situated in City Hall Park and will probably be completed before this item is published. Three others are already in operation, and the fifth will soon be built in Central Park. The price is one cent per glass. One of the newspapers remarks: "Fewer calls upon the doctor is one of the advantages." Although the enterprise was begun in 1894, as late as July, and many of the booths were in operation barely two months, a total of 600,000 glasses of milk were sold. With the earlier start this year and the increased popular knowledge regarding the plan, the total is likely to be doubled. The scheme has heavy expenses aside from the cost of the milk. There is a pay-roll of those engaged solely in this work which foots up $300 a week now, and is likely to be materially increased during the height of the season. To begin with, twenty-two young women are employed as clerks in the eleven booths and depots. Then eight men and two boys are needed upon the trucks which are constantly busy carrying the milk from the railway terminals to the central distributing point, and thence to the booths and depots. Tons of ice are consumed daily in keeping the milk cool, and the cost of construction of booths and rent of depots is a considerable item in the expense total.

A Health Commissioner Resigns.—A change has taken place in the New York City Board of Health. Dr. George B. Fowler becomes Commissioner, *vice* Dr. Cyrus Edson, resigning by request of Mayor Strong. Dr. Edson has sustained a good reputation in his public life, but he has the unfortunate handicap to bear of being too closely linked with the malign influences that grew out of Tammanyism. Dr. Edson's father is an ex-Mayor of the variety that sits now under public condemnation; so that the "Tammany tiger cubs," as the New York *Herald* remarks, are not always judged according to their merits. However, Dr. Edson (unless the reporters have been misled) is reported as paying himself the following delicate tribute: "I have given the best portion of my life to the service of the Board of Health, beginning on the lowest rung of the ladder. I have held nearly every subordinate position to which a physician is eligible. Through all these offices I have been promoted without a backward step. I have served through several epidemics and have had the good fortune to direct my subordinates to such effect as to repeatedly stamp out contagious disease when it seriously threatened the people of the city. I believe that the Board of Health was never so efficient as at the present time." When asked about alleged charges that he had been too free in the use of his official signature in mercantile ways, he is reported as replying: "I have several lawsuits against firms who have used my name to advertise themselves." He said he was not sorry to give up the position, and that he could make more money by his private practice.

"State Care" of the Insane of New York.—Although many strenuous efforts have been made to secure the passage and signature of an act to compel the county authorities of New York to transfer their pauper insane to the State Lunacy Commission, the result has been a failure in 1895. Mayor Strong declined to approve of the law, and the Governor could not sign it without that approval. The New York *Herald* now appeals to the State Commissioners to proceed by urgent measures, through orders of the Supreme Court, to compel the county commissioners to amend existing abuses. It demands that no delay be allowed in the matter of improving the maintenance of "the unfortunate creatures immured in the island madhouses and at Central Islip." The writer further argues the necessity for action by the Lunacy Commission as follows:

"No one, better than the State Commissioners in Lunacy, realizes the shocking state of affairs in the New York city asylums. They knew much before of the evil and neglect, the underfeeding, the wretched food and housing of the inmates, the insufficient number of attendants and the brutal nature of some of the men employed. They knew of the filthy bedding and the filthy bathing. They have made reports upon these features and have made recommendations which have been ignored. It is time for them to act in the premises. The law gives them ample power. They have already resorted to extremities in Kings County, where they compelled the local authorities under an order from Judge Cullen, of the Supreme Court, to amend abuses. Will they act now in the case of New York, or will they permit to exist the abuses of which they complained to Mayor Grant, to Mayor Gilroy and to Governor Morton? The Commissioners, alone, now have the power to terminate the inhumanity that disgraces New York, and which through failure to correct, bears upon the administration of Mayor Strong."

Mayor Swift of Chicago has appointed ex-Alderman Kerr to be Commissioner of Health of that city. Much criticism has been evoked because the appointee is a non-medical man, but it is understood that a new Health Department will be created, on a sound basis, and on a scale equal to the needs of the city, as soon as the ordinance can be prepared, which it is expected will be ready on the reassembling of the City Council after the summer vacation. Dr. John B. Hamilton, the editor of this JOURNAL, has, pending re-organization, been requested by the Mayor to act as consulting hygienist to the Health Department and in that capacity will prepare the plan for the new department. In the meantime, Dr. Frank W. Reilly, the Assistant Commissioner of Health, formerly Secretary of the Illinois State Board of Health, will continue in his present position, to give necessary advice to the new Commissioner in the performance of his daily sanitary duties.

[1] Provincial Medical Journal, No. 160, 1895.

Health Reports.—The following health reports have been received by the Supervising Surgeon-General, Marine-Hospital Service:

SMALLPOX—FOREIGN.

London: June 8 to 15, 1 death.
Dublin: June 8 to 15, 13 cases, 2 deaths.
Alexandria: May 14 to 20, 1 death.
Cairo: May 14 to 20, 3 deaths.
Bologna: June 8 to 15, 1 case.
Calcutta: May 11 to 18, 67 deaths.
Havana: June 13 to 20, 8 deaths.
Liverpool; June 8 to 15, 1 case.
Madrid: May 26 to June 9, 5 deaths.
Moscow: May 25 to June 1, 3 cases.
Odessa: June 1 to 8, 6 cases.
Prague: June 1 to 8, 9 cases.
Rheims: June 8 to 15, 1 case.
Rio de Janeiro: May 18 to 25, 4 deaths.
Rotterdam: June 8 to 15, 1 case, 1 death.

SMALLPOX—UNITED STATES.

Tennessee: Memphis, June 15 to 29, 6 cases.
Pennsylvania: Philadelphia, June 15 to 22, 1 case, 1 death.
Missouri: St. Louis, June 15 to 22, 1 case.
Michigan: June 15 to 22, smallpox reported at Detroit and Olivet.
Indiana: Evansville, June 19 to 26, 1 case.

CHOLERA.

Bombay: May 14 to 21, 2 deaths.
Calcutta: May 11 to 18, 48 deaths.
Hiogo: May 27 to June 3, 8 cases, 7 deaths.

YELLOW FEVER.

Havana: June 13 to 20, 10 cases, 5 deaths.
Santiago de Cuba: June 8 to 22, 19 deaths.
Maracaibo: June 8 to 15, 1 case, 1 death.
Rio de Janeiro: May 18 to 25, 23 deaths.
Vera Cruz: June 13 to 20, 8 deaths.

NECROLOGY.

Louis A. Hoffman, M.D., died June 1 at his home on Ferry Street, Newark, New Jersey. He was a native of the United States and in his fortieth year. He had been sick about five weeks with an attack of dysentery, complicated with meningitis. He had been a resident of Newark about four years and had served as one of the district inspectors of the Board of Health. A widow and one son survive him.

Dr. Lewis D. Harlow, M.D., died June 23, of heart disease at his home in Philadelphia. He was in his usual health and attended to his practice up to the day before he died. Dr. Harlow was born June 16, 1818, in Vermont and was graduated in medicine by the University of Pennsylvania, in 1845. After spending a few years in country practice, he came to Philadelphia and was elected to a Chair in the Philadelphia College of Medicine and afterward to a Chair in the Pennsylvania College. He was one of the founders of the Philadelphia Obstetrical Society, and its President in 1878. He was a member of the Academy of Medicine, Fellow of the College of Physicians and other societies. He was a delegate to the American Medical Association meeting at Philadelphia in 1872.

Alexander Barnett Pope, M.D., of New York City, died suddenly June 12, aged 35 years. Dr. Pope was a native of Washington, Georgia, and was educated at the University of Virginia. His medical degree was obtained at the New York College of Physicians and Surgeons, class of 1884. In 1886, he was, for a time on the medical staff of Bellevue Hospital. For some time past he had been connected with the Polyclinic, the Vanderbilt Clinic and St. John Guild. The position held by him at the clinic above named, from 1888, was in the department of diseases of children. Among the other appointments held by him, was that of an attending physician at the Bellevue Hospital Dispensary, chair of general medicine from 1886 to 1888; in the Demilt Dispensary from 1888, in the department of the heart and lungs; which latter subjects were those of his polyclinic service. The press notices refer to the fact that Dr. Pope was possessed of considerable inherited property in Georgia, and he was the nephew of Prof. Bolling A. Pope, M.D., of Dallas, Texas. It is also stated that several years ago, while treating children, he contracted diphtheria and scarlet fever, and had a long siege of illness which left him with a weak heart.

MISCELLANY.

Dr. A. C. Cotton of Chicago, has been appointed as City Physician to succeed Dr. Todd.

Bequests to New York Institutions.—Under the will of the late Percy R. Pyne, who died at Rome, Italy, in February, certain charitable objects are remembered. The testator leaves the sum of $20,000 each to the Young Men's Christian Association in this city, St. Luke's Hospital and the American Museum of Natural History.

Conflagration at the New York Quarantine.—On June 18, the Staten Island Station of the Health Officer at the Port of New York was destroyed by fire. The building was a commodious frame structure, built in 1894, at a cost of $10,000. Dr. Doty's residence, standing on a bluff, just above the station, was spared, although for a time in serious danger. Many valuable records were destroyed in the burning building. The cause of the fire was not discovered.

Selection of Skilled Surgeons Discharges every Obligation.—The Supreme Court of Tennessee puts itself in line with the few courts which have before it passed upon the same question, by holding, in the case of Quinn v. Kansas City, M. & B. R. Co., May 2, 1895, that, having selected surgeons skilled and competent in their profession, a railway corporation discharges every duty that humanity or sound morals impose, and that it is in no way liable for the mistakes they may subsequently commit.

On the Roll of Honor.—There are fifty-three names on the Roll of Honor, inscribed on the dome of the new House of Representatives in the State House at Boston, Mass. Each of these names is chosen as a representative of some great or worthy deed, or the opening of some new epoch. Among these names appears that of Dr. Thomas T. G. Morton as one of the founders of modern surgical anesthesia, chiefly because he made a definite series of experiments with sulphuric ether, in order to test the efficacy of that agent in the production of unconsciousness.

Entitled to Compensation for Making Post-mortem Examination.—Following its decision in the case of Flinn v. Prairie County, reported in the Journal of the American Medical Association, June 22, 1895, page 991, the Supreme Court of Arkansas holds, in Clark County v. Kerstan, decided May 4, 1895, that a physician who makes a post-mortem examination at the request of the coroner is entitled to a reasonable compensation for so doing, but is not entitled to additional compensation for disclosing as a witness the results of the investigation and giving an opinion by reason of that knowledge and skill acquired by devotion to his particular profession, beyond the regular witness fees.

Requisites to Collection of Compensation for Medical Services.—The Indiana statutes make it unlawful for any person to practice medicine, surgery or obstetrics in that State without first having obtained a license to do so, and provide further that no action shall lie in favor of any person for services as physician, surgeon or obstetrician unless he shall have been so licensed prior to the rendering of the services. Under such a law, the Appellate Court of the State holds, in the case of Cooper v. Griffin, decided May 14, 1895, that it is not necessary, in filing a claim against an

estate for such services, for the claimant to allege that he was a regularly licensed physician at the time the services were rendered; but that, in an action to recover for such services, no *prima facie* case is made out without making proof of the issuing of the required license.

A Botanical Garden for New York City.—The New York Legislature in 1893 passed a law making it mandatory upon the city to provide a tract of park land not less than 250 acres in extent and to appropriate $500,000 for the purposes of a garden, provided that within three years one-half that named sum should be contributed by the citizens for the same object. The requisite subscriptions were raised a short time before the three years' limit was reached, so that it now devolves upon the city authorities to issue bonds and proceed to the erection of the necessary buildings. The gardens will be located in the center of Bronx Park, with the river of that name flowing through the middle of the reservation. The gardens will be patterned after the celebrated Kew Gardens, near London. It is said that in all North America there is only one botanical garden worthy of the name, the one developed by the late Mr. Shawe, of St. Louis, Mo. Apart from the European gardens, admirable collections are to be seen in Mexico, Brazil, Sumatra, Ceylon and Borneo, the excellence of which New York may not hope to rival for many a long year. Still, a good beginning is not to be despised.

A "Pedic Society" Formed.—The union of the chiropodists of the country in an organization has been effected under the laws of the State of New York. A newly passed law gives "protection" to the citizens and to those already in the business by giving the society power to appoint a Board of Examiners, three in number. This board will license applicants that are found competent to practice as chiropodists. All persons now practicing as such in the State shall receive a diploma without examination if they apply to the examining board within sixty days. Persons who have been practicing for not less than ten years without having obtained the certificate for qualification from the State Pedic Society must register by January 1 next, with the clerk of the county in which they reside. Every person on receiving the certificate of qualification to practice shall pay into the treasury of the society the sum of $15.

The Will of a Salem Physician.—The will of the late Dr. William Mack, filed for probate at Salem, Mass., contains the following bequests: American Unitarian Association, $35,000, to be added to an equal sum given by his sister, Elizabeth, and considered as the legacy of Harriet O. Mack; Massachusetts Medical Benevolent Society, $1,000, and to the city of Salem Lodge Hill, in North Salem, for park purposes. The residue of the estate is left in trust, the income, after payment of a few private bequests, to be divided between the Essex Institute and the Salem Fraternity. Upon the death of the persons receiving annuities, $20,000 of this residue is to be paid to the Salem Fraternity for the establishment of coffee rooms, the balance to be divided equally between the Salem Fraternity and the Essex Institute. Dr. Mack was a graduate of Harvard Medical School in the year 1833.

The "Gold Cure" is not quite Dead in England.—The *Medical Press and Circular* of London has been an outspoken enemy of Keeley of the "gold cure" notoriety. In a late issue that journal returns to the charge, for the purpose of showing up the schemes of the present "promoters" in that city. The following note appears in its issue of May 22: "Not content with past failures to induce the profession to take up his so-called 'Cure for Inebriety,' another attempt is now being made to promote the venture on a commercial basis, and the public are asked to subscribe the sum of £25,000 for the privilege. A Dr. Wolf is the promoter, and he modestly claims £10,000 of this in cash and £15,000 in fully paid shares. Doubless, relying on the gullibility of the British public, 'he wishes he may get it,' but he has to reckon with the press, and as the writ Dr. Keeley served on us on a previous occasion did not frighten us, so we shall do our duty to the profession and the public now when the occasion arises."

A Case of Baelz's Disease.—In 1890 Unna described an ulceration of the glands of the labial mucous membrane, to which Professor Baelz, of Tokio, had called attention and to which he gave the name of Baelz's disease. No more cases have been seen until recently, when Van Dort describes one in an unmarried woman of 30, affected with an ulcer of the lips for the previous two months. The affection began with a small painless papule, rather thick, which after a few days began to ulcerate, extending slowly in periphery and depth. The ulcer was localized in the middle of the left half of the upper lip. Its form was oval, the edges red, rather sharp, but little tumefied and covered with crusts in some places. The bottom of the ulcer was covered with yellowish matter, adhering rather closely; the parts surrounding the ulcer were infiltrated. There was no pain, either spontaneously or on pressure; no engagement of the maxillary glands. The patient had frequently had attacks of tonsillitis, but no other antecedents. By application of tincture of iodin recovery ensued in four weeks.[1]

St. Luke's Hospital, New York City.—This institution is to receive a legacy of about $200,000 by the will of the late Rufus Waterhouse, manufacturer of men's furnishing goods. This is in the interest of consumptive sewing women or consumptives dependent upon sewing women. Mr. Waterhouse's wife, whose name the ward will bear, died of the disease, and he saw many of the young women he employed in his business stricken with it, and unable to support themselves. He died a widower and childless, and save for four legacies of $1,000 each to his brother Samuel, his sisters, Mary E. Dognio and Eliza Hatch and Nancy S. Waterhouse, the widow of a deceased brother, left all his estate to St. Luke's Hospital for the ward. Four trust funds of $10,000 each, in favor of those named were also created, they to receive the incomes, and the principals to revert to the hospital at their deaths. The beginning of the end of the present St. Luke's Hospital, at Fifth Avenue and Fifty-fourth Street, was inaugurated June 20, when the authorities of that time-honored institution declined to receive private patients, in order to adapt themselves to the restricted accommodations which will obtain until the hospital takes possession of its new home on Morningside Heights in the fall. The capacity of the old institution will be reduced from 225 beds to about half that number. These will be contained in the east half of the institution, until the time comes for a removal to the new site.

Modifications of the Skin in Tuberculous Patients.—Schtangueieff has observed two cases of marked dermal changes in the tuberculose. The first was that of a man 30 years old, suffering with acute pulmonary and laryngeal tuberculosis with aphonia, much emaciated, in a semi-typhoid state and with a temperature of 104 degrees. Suddenly there developed confluent ulcerations of the throat, palate and inside of the cheeks; the surfaces were covered with a whitish coat, like thrush. At the same time there was an intense erythema of the neck, resembling erysipelas or scarlatina, which rapidly extended to the subspinous fossa behind. This eruption lasted for about fifteen days, until the death of the patient. The other case had, for some weeks before death, an erythema of the left foot, with edematous swelling and a sensation of heat. There was at the same time a constant

[1] Rev. de Derm. et Syph., May, 1895.

hyperemia of the cheek and ear on this side, on which also the pulmonary lesion was located. The maximum redness and swelling of the foot coincided with the maximum of the fever. Since observing these cases the author has often observed—especially in the acute stages two or three weeks before death—besides pityriasis and ordinary miliaria, ephemeral spots on the skin, analogous to those seen in diphtheria and measles. The marbled state of the skin is still more frequent.[1]

Cæsarean Section: 1887-1895.—At a recent meeting of the Obstetrical Society of France, Démelin read a paper on the statistics of Cæsarean section compared with those of Porro's operation. The author has collected 164 cases of the section with a mortality of 22 per cent. for the mothers and 2 per cent. for the children; on the other hand, 55 of Porro's operation gave 25 per cent. mortality for the mothers and 50 per cent. for the children. These are the gross figures. The prognosis grows better each year. Taking only those cases since 1893, the maternal death rate is 16 per cent. for the section and 10 per cent. for the operation. The fetal prognosis is also improving, but is much higher in the Porro operation, being nearly 2 to 1. Speaking generally, it may be said that the general cause of death in the latter is septic infection. The best time to operate is just before or just after the commencement of labor, and if the membranes have not ruptured it is especially favorable. Nevertheless, it is not rare to see successes when the operation has been delayed for several hours or even days after the beginning of labor and rupture of the membranes (Van der Mey, Braun, Galabin, Godson, Gray, Schwartz). Rapidity in operation is of the greatest importance and Kelly, among others, has especially insisted on this. The time consumed should not exceed half or three-quarters of an hour. Comparing the section with the utero-ovarian amputation, it is seen that the tendency, save in special cases, is to return to the simple hysterotomy which may be repeated and, moreover, preserves the child-bearing faculty. The Porro operation is to be preferred when the patient has been in labor a long time and the uterus is already infected, or when serious and rebellious hemorrhage follows the extraction of the child, or in the presence of specified complications. The reasons for operative interference in the collated cases were: 1, contracted pelvis, ninety-four cases; 2, uterine fibromas, nineteen cases; 3, cancer of the cervix, eleven cases; 4, pelvic tumors, nine cases; 5, ovarian tumors, three cases; 6, eclampsia thirteen cases; 7, various causes of dystocia, such as stenosis of the vagina, cancer of the rectum, edematous elongation of cervix, etc.; there were also four cases of post-mortem Cæsarean section. As regards the children, in the operation by section, many are extracted apparently dead and a certain per cent. soon die. During the first year the mortality for these children is 40 per cent. against 18 per cent. for those born naturally.[2]

Society Notes.

Brooklyn Medical Society.—A new organization, named as above, received articles of incorporation on June 12. A board of nine trustees will serve during 1895-96, as follows: Albert H. Brundage, H. Fred. Adams, John T. Gibbons, Stanley G. Clarke, Herman L. Armstrong, William A. Myers, Benjamin F. M. Blake, John H. Droge and Christopher D. Kevin.——The ninth annual meeting of the American Orthopedic Association will be held in Chicago, September 17, 18 and 19. The officers of the association are: President, John Ridlon; First Vice-President, Bernard Barstow; Second Vice-President Louis A. Weigel; Treasurer, E. G. Brackett; Secretary, Royal Whitman.

[1] Rev. de Derm. et Syph., May, 1895.
[2] Rev. Med. et Chir. Prat., No. 9, 1895.

Louisville Notes.

Chandler.—Dr. W. T. Chandler, of Campbellsville, met with an accident while bicycling near his home which will confine him to bed for some time. While coasting down a hill he ran into a drove of hogs, in the road, and was thrown from his wheel.

Dentists.—The twenty-fifth annual meeting of the Kentucky Dental Association was held in Lexington, Ky., during the past week. The Secretary's report showed 104 registered dentists in the State. Twenty stood the examination under the new law recently and seven passed.

Change of Address.—Dr. Wm. L. Rodman has moved to the house formerly occupied by the late Dr. Hewett, at 821 Third Avenue.

G. A. R.—Dr. W. P. White, Medical Director has furnished the following names as officers for the coming encampment: Director, Dr. W. P. White; Secretary, Dr. Henry E. Tuley; Assistants, Dr. Thos. S. Bullock and Dr. C. T. Pope; Ambulance Corps, Dr. E. L. Pearce; Chairman Ladies' Medical Department, Dr. Julia Ingram; Secretary, Dr. Anna Lawrence.

Chairmen of various wards: First Ward, Dr. Peter Gunterman; Second, Dr. Robt. Fallis; Third, Dr. J. M. Krim; Fourth, Dr. F. C. Leber; Fifth; Dr. T. P. Satterwhite; Sixth, Dr. I. N. Bloom; Seventh, Dr. J. M. Mathews; Eighth, Dr. T. L. McDermott; Ninth, Dr. S. H. Garvin; Tenth, Dr. George Simpson; Eleventh, Dr. W. B. Doherty; Twelfth Dr. H. H. Grant. Dr. Chas. P. Cook, New Albany, Chairman. Dr. T. A. Graham, Jeffersonville, Chairman.

Health of the British Army.—The thirty-first annual report of the Army Medical Department for the year 1893, submitted by Director-General Mackinnon to the Secretary of State for War, has just reached this side of the Atlantic. Some of the prominent points in this issue of the familiar yellow-covered series may be of interest to military surgeons and others. Somewhat over 100,000 men served in the United Kingdom during the year, and of these the statistics are said to be favorable. There was a serious outbreak of enteric fever at Aldershot and influenza continued to cause a large amount of sickness; but with these exceptions it is considered by the Director-General that there was no point concerning the health of the troops of the United Kingdom calling for special notice. The admission rate per thousand of strength was 751.6; the constant sick rate 44.10; the average sick time to each soldier 16.10 days, and the average duration of each case of sickness 21.42 days. These cases represent those that in the United States military service would be reported as hospital cases. The trivial cases which are taken on sick report in this country and add so materially to our admission rates, are not reported by British medical officers. The rate of discharge for disability was 15.70. More than one-fifth of this rate was due to diseases of the circulation and of the nervous system, and one-tenth to tubercular disease. The death rate was 5.13. Concerning sickness, some interesting points may be noted: scarlet fever caused a total of 843 admissions and 14 deaths, this relatively extensive prevalence due probably to the extreme youthfulness of so many of the "men." Enteric fever caused 151 admissions and 22 deaths; 49 of the cases with 9 deaths at Aldershot, and 25 with 3 deaths in Dublin where this fever is notoriously prevalent. Besides these enteric fevers there were 459 admissions for other continued fevers. Taking all forms of venereal diseases together the admissions were equal to a rate of 194.6 per thousand of strength and the constantly sick to 16.68. These rates when compared with the average of the past seven years show a slight decrease in the prevalence of these diseases. In the Channel Islands the admission rate for the year was 327.5; in the Home district 291.2. The district showing the lowest rate of prevalence was that of Cork with 92.4. Alcoholism caused a total of 152 admissions and 5 deaths, 7 of the admissions being for delirium tremens. The British soldier on Home service is not specially exposed to injury, the admis-

sion rate for accident and violence having been only 95.1 and the death rate 0.74. There were 24 cases of suicide during the year. This annual number seldom varies much; the average of the past two years was 21. Gunshot was the method adopted in 15 of the cases.

It appears from the recruiting records of the Home stations that of 64,110 candidates for enlistment inspected during the year 37,769 or 589.13 per thousand were found fit for service. Only 55.51 per thousand were rejected for defective vision. The acuteness of vision required for acceptance is only one-fourth of that called for by the U. S. Regulations. On the other hand, as so many undeveloped boys present themselves before the British recruiting officers, 281.89 per thousand examined were rejected as deficient in height, weight or chest measurement. Excluding boys under 17 years of age, the average age of the recruits finally approved during the year was 19.4 years, the average height 5 feet, 5.8 inches, the average weight 125.1 pounds and the chest measurement 33.6 inches. Of every thousand 75 were well educated, 877 were able to read and write, 16 able to read only and 32 unable to read.

Of the colonies, Canada and Bermuda, each with a strength of about 1,400 men, had the best health records; an admission rate of less than 600 per thousand of strength and a constant sick rate of about 31, although enteric fever was rather prevalent in the latter, increasing its death rate to 10.10 as compared with 4.91 in Canada. There were 43 cases with 9 deaths. The disease was attributed to defective sewerage and the existence of cesspits near and even under the walls of buildings. Cyprus, Malta and Gibraltar had rates which differ but little from those of the United Kingdom, with the understanding, however, that a certain number of cases were sent home as invalids, thus lessening the number of sick present with these commands. At Cyprus, with an average strength of 550 men, venereal affections were the prominent diseases, constituting 165.5 admissions per thousand and 15.65 constantly sick. At Malta, with an average strength of 7,161, there was an outbreak of enteric fever, 101 cases, of which 32 were fatal, and 938 cases of other continued fevers of which 5 were fatal. A committee appointed to investigate this outbreak attributed it to infection in the milk supply and to impure water in the tanks. The fever appeared within fifteen days after heavy rainfalls had filled the tanks, at a time when polluting matter was most likely to gain entrance with the rainfall. At Gibraltar, strength 4,743, the sick rate was higher than in previous years, owing to the prevalence of simple continued fever and to the increased prevalence of venereal diseases. The medical officer in charge of the station hospital considered that many of the febrile attacks were due to chill and that the heading "febricula" would represent their characteristics with greater fitness than simple continued fever. The admission rate for venereal disease was 205 1 and the rate of constant sickness 18.32.

The Mauritius had the largest admission rate. With a strength of 551 its rate was 1,547.7 per thousand; 74.75 of constant sickness; a death rate of 17.30 and 58.78 sent home or discharged. Malarial fevers of a severe and fatal type prevailed on the island during the greater part of the year, many of the cases being called "malignant" by the local practitioners. Observation shows that prolonged residence in Mauritius increases the liability to these fevers and that there is no such thing as acclimatization as regards pure-blooded Europeans; residence in this colony, even when attacks of malarial fever are escaped, induces a general deterioration of the health. In the fatal cases during the year, the blood appeared to be quite disorganized, as evidenced by petechial eruptions, lividity of the skin, by the presence of blood in the vomited matter, urine and stools during life, and by a black fluid condition of the blood after death and very rapid decomposition of the body.

Egypt, with a garrison of 5,073 had the highest death rate 23.25, with 72.29 constantly sick and 94.19 discharged or sent home per thousand. The chief causes of non-efficiency were venereal affections, nearly one-third of the admissions being due to these diseases. India, with a strength of 69,865 men gave the highest rate of constant sickness 76.22 with an admission rate of 1,448.3 and a death rate of 15.21. Enteric fever was not so frequent as usual and cholera was rare; but venereal diseases were largely prevalent and some of the cases of a most virulent type. In the Bengal command the rate of constant sickness from venereal affections was 29.90 and in the Madras command 37.60. The total admissions for enteric fever in Bengal numbered 1,076 and the deaths 276. With seven exceptions the disease was present in every station of the command, 64 in number. Rawalpindi had the largest number, 94 with 29 deaths. These occurred mostly in young soldiers of less than one year's service. At Umballa 78 cases with 23 deaths; at Lucknow 73 cases with 11 deaths and so on.

The disease is generally believed to be contracted in bazars and villages or by drinking contaminated water from pools and ditches out of cantonments. Mr. Hanken, biologist of the Northwestern Provinces government, found the bacillus of typhoid in several of the surface waters near Lucknow. One medical officer, however, reiterates his belief, expressed in previous reports that a fever of a prolonged nature, having as its pathognomonic sign, ulceration of the ileum, can be caused without a specific excitant; that, in fact, youth, indiscretion, undigested food, undue exposure to heat and to fatigue are factors enough in themselves to produce in many people a fever, the nature of which is such that 25 per cent. of the patients die. Several other observers mention that the cases which have occurred in their practice "have not been produced by specific poison."

The first of the appended papers consists as usual of a report on the progress of hygiene during the year, but there is little in it that is not already familiar to readers of the JOURNAL. The report on the International Congress of Buda-Pesth is stale reading, but Prof. J. Lane Notter of the Army Medical School prefaces it with an interesting account of the water and sewerage systems of certain continental cities inspected while en route to the meeting. Surgeon Lieut.-Colonel W. S. Pratt reports on the eighth congress of the Association Francaise de Chirurgie. Surgeon-Major H. E. R. James gives a full and valuable report on the plague at Hong Kong. The remainder of the appended papers are mostly reports of surgical cases occurring in army practice.

THE PUBLIC SERVICES.

Army Changes. Official list of changes in the stations and duties of officers serving in the Medical Department, U. S. Army, from June 22, 1895, to June 28, 1895.

Capt. ALFRED E. BRADLEY, Asst. Surgeon, will be relieved from duty at Ft. Custer, Mont., upon the arrival there of Major WILLIAM C. SHANNON, Surgeon, and will report at Ft. Yellowstone, Wyo., for duty at that post, relieving Capt. CHARLES M. GANDY, Asst. Surgeon. Capt. GANDY, on being thus relieved, will report for duty at Washington Bks., D. C.

LETTERS RECEIVED.

Ammonol Chem. Co., New York, N. Y.; Austin & Graves, Boston, Mass.; Ashmead, A. S., New York, N. Y.

Blakiston, P., Son & Co., Philadelphia, Pa.

Castle, Wilmot & Co., Rochester, N. Y.; Clary, Geo., New Britain, Conn.; Columbia Chemical Co., Washington, D. C.; Corby, S. B., Chicago, Ill.; Cone, A., New York, N. Y.; Clark, A. P., Boston, Mass.; Cleaves, M. A., New York, N. Y.; Crowe, S. W., New York, N. Y.; Cutter, John A., New York, N. Y. Central College of Physicians and Surgeons, Indianapolis, Ind.

D'Ancona, A. A., San Francisco, Cal.; Davis, J. L., Cincinnati, Ohio.

Elliott, A. R., New York, N. Y.; Elce Bros., Galena, Ill.

Fehr, Julius, Hoboken, N. J.; Fringer, W. R. Rockford, Ill.; Frank & Kratzmueller, Chicago, Ill.; Fite, C. C., New York, N. Y.; Fuller's C. H. Adv. Agency, Chicago, Ill.

Greene, Chas. S., San Francisco, Cal.; Gleitsmann, J. W., New York, N. Y.; Goode, Thos. F., Buffalo Lithia Springs, Va.; Givens, J. W., Blackfoot, Idaho.

Herrick, S. S., San Francisco, Cal.; Hummel, A. L., Philadelphia, Pa., (2); Holmes, M. C., New York, N. Y.; Hughes, J. W., Montreal, Canada; Hurd, Henry M., Baltimore, Md.; Henrotin, F., Chicago, Ill.; Halabasta, Jatebonse & Co., London, England; Hickes-Juda, The Co., San Francisco, Cal.

Kellogg, J. H., Battle Creek, Mich.; Kleene, Fred, Chicago, Ill.

Jackson, Edward, Denver, Colo.; Janson, E., Astoria, Ore.; Johnson & Johnson, New York, N. Y.

Lehn & Fink, New York, N. Y.; Lloyd, T. M., Brooklyn, N. Y.

Mowery, H. A., Marietta, Pa.; Mason, L. D., Greenwich, Conn., (2); Mueller, V. T., Milwaukee, Wis.; Mann, E. C., New York, N. Y.; Michael, John E., Baltimore, Md.

Nordhoff, Sofie, Washington, D. C.; Newman, H. P., Chicago, Ill.

O'Brien, Joel T., Groveland, Ill.

Pennington, J. A., Chicago, Ill.; Post-Graduate Medical School, Chicago, Ill.

Robbins, M. M., Aurora, Ill.; Robinson, R. D., La Fayette, Ind.; Ruggles-Gale Co., Columbus, Ohio; Rio Chemical Co., St. Louis, Mo.

Stechert, G. E., New York, N. Y.; Standlee, E. L., St. Louis, Mo.; Stokes, W. B., Coldwater, Ky.; Saunders, W. B., Philadelphia, Pa.; Smart, Chas., Washington, D. C.; Stewart, J. B., Atlantic City, N. J.; Seymour, F. F., Fort Dodge, Iowa; Saunders, W. B., New York, N. Y.; Small, A. R., Chicago, Ill.; Smith, J. R., Blanchard, Ohio; Stiles, W. C., Kewanee Ill.; Scribner's, Chas. Sons, New York, N. Y.; Schieffelin & Co., New York, N. Y.

Taylor, R. H., Griffin, Ga.; Trueheart, P. P., Kansas City, Mo.; Tucker, John H., Henderson, N. C.

Winne, C. H., Fort McHenry, Md.; Warner, W. R. & Co., Philadelphia, Pa.; Wyckoff, R. M., Brooklyn, N. Y.; Wells, J. E., Mt. Olivet, Ky.; Wilhite, J. O., Anderson, S. C.; White Rock Mineral Spring Co., Chicago, Ill.; Wimmer, S. J., St. Marys, Pa.

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